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United States  
Department of  
Agriculture

Rural  
Electrification  
Administration

REA  
Bulletin  
43-5

aTK4018  
, u5

# List of Materials

Acceptable for Use on Systems  
of REA Electrification Borrowers



AS gr

July 1987

#### PREFACE

This list supersedes all preceding issues including revisions. Revised sheets reflecting changes in the list will be issued quarterly and should be inserted in order to keep your copy up to date.

The items shown in this publication include material and equipment for transmission and distribution facilities and specific items of electric general plant. Items not listed include office equipment, tools and work equipment, and consumer owned wiring facilities. The listings apply only to new items of material and equipment and not to used items.

In addition to items accepted on a general basis, this list also includes items accepted on a conditional basis. As one of the conditions in the listing of an item on a conditional basis, contractors are required to obtain the borrower's concurrence prior to its use.

The acceptance of an additional item or the deletion of an existing item is a function of the Technical Standards Committees. Any manufacturer desiring to have a new item placed on the list, or any user believing an existing item should be removed from the list, is invited to submit the matter to the Committees. Any communication calling attention to an error or omission in the list, such as a wrong catalog number, an obsolete item, etc., will be appreciated. All communications should be addressed to Technical Standards Committee "A" (Electric), Rural Electrification Administration, U. S. Department of Agriculture, Washington, D. C. 20250.

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a-1  
July 1987

a - Insulator, pin type

Specifications

5 kV - used on 2.4 kV and  
4.16/2.4 kV systems



ANSI Class 55-2	<u>Plain</u>	Radio-freed
Flashover, dry	50 kV	45 kV
Flashover, wet	25 kV	25 kV
Leakage distance	5 in.	5 in.
Pinhole diameter	1 in.	1 in.

Chance  
\*\*McGraw-Edison  
Porcelain Products  
(Knox)  
Victor Insulators, Inc.

C905-1302\*  
NP8D8\*  
253

8

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12.5/7.2 kV - used on 12.5/7.2  
and 13.2/7.62 kV systems



ANSI Class 55-3	<u>Plain</u>	Radio-freed
Flashover, dry	65 kV	55 kV
Flashover, wet	35 kV	30 kV
Leakage distance	7 in.	7 in.
Pinhole diameter	1 in.	1 in.

Chance  
Joslyn (Pinco)  
McGraw-Edison  
Porcelain Products  
(Knox)  
Victor Insulators, Inc.

C905-1303\*  
L63R\*  
NP9D8\*  
261-S\*

5\*

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15 kV - used on 12.5/7.2  
and 13.2/7.62 kV systems where  
greater insulation is needed



ANSI Class 55-4	<u>Plain</u>	Radio-freed
Flashover, dry	70 kV	65 kV
Flashover, wet	40 kV	35 kV
Leakage distance	9 in.	9 in.
Pinhole diameter	1 in.	1 in.

Chance  
Joslyn (Pinco)  
McGraw-Edison  
Porcelain Products  
(Knox)  
Victor Insulators, Inc.

C905-1304\*  
L2064R\*  
NP21D8\*  
366-S\*

6\*

\*Radio-freed

\*\*Available in white as indication of neutral. White insulators are non-radio-freed.

Radio-freed and non-radio-freed insulators made by these manufacturers and in these styles are acceptable.

NOTE: Post insulators (Item ea) may be substituted for the crossarm pin (Item f) and pin insulator (Item a) for both small and large conductor distribution drawings shown in REA Form 803 at the option of the owner.

a-2  
July 1987

a - Insulator, pin type  
(Radio-free)

Specifications

Used on 24.9/14.4 kV  
distribution lines.

Radio noise free, metal  
thimble



ANSI Class 56-1

Flashover, dry 95 kV

Flashover, wet 60 kV

Leakage distance 13 in.

Pinhole diameter 1-3/8 in.

Chance

Joslyn (Pinco)

Porcelain Products  
(Knox)

Victor Insulators, Inc.

C906-1311

L1123-R

1027-S

127-R

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Used on 33 - 34.5 kV  
transmission lines.

Metal thimble



Chance

Joslyn (Pinco)

Porcelain Products  
(Knox)

Victor Insulators, Inc.

C906-1303

L75-R

2045-S

245-R

ANSI Class 56-3

Flashover, dry 125 kV

Flashover, wet 80 kV

Leakage distance 21 in.

Pinhole diameter 1-3/8 in.

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Used on 44 - 46 kV  
transmission lines.

Metal thimble

Victor Insulators, Inc.

225-R



ANSI Class 56-4

Flashover, dry-wet 140-95 kV

Leakage distance 27 in.

Pinhole diameter 1-3/8 in.

NOTE: Post insulators (Item ea) may be substituted for the crossarm  
pin (Item f) and pin insulator (Item a) for both small and  
large conductor distribution drawings shown in REA Form 803  
at the option of the owner.

Conditional List  
a(1)  
July 1987

a - Insulators, pin type  
(Radio-freed)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
*Chance C906-1321 24.9/14.4 kV ANSI Class 56-1	1274 2/9/84	To obtain experience.
*McGraw-Edison NP2T8 24.9/14.4 kV ANSI Class 56-1	1205 2/5/81	To obtain experience.
*Porcelain Products (Knox) 1027-ST 24.9/14.4 kV ANSI Class 56-1	1321 5/29/86 1334 1/15/87	To obtain experience.
*Victor Insulators, Inc. 27R 24.9/14.4 kV ANSI Class 56-1	1235 5/27/82 1334 1/15/87	To obtain experience.

\*Does not have metal thimble.

NOTE: Post insulators (Item ea) may be substituted for the crossarm pin (Item f) and pin insulator (Item a) for both small and large conductor distribution drawings shown in REA Form 803 at the option of the owner.

b  
July 1987

b - Pin, pole top, steel

DISTRIBUTION

	<u>12.5/7.2 or 13.2/7.62 KV</u>	<u>24.9/14.4 KV</u>
Pin length, inches :	20	20
Thread diameter, inches :	1	1-3/8
Hole spacing, inches :	8	8
REA Specifications :	D-3	DT-3
Chance	2199	2195
Dixie	D-2172	D2195
Joslyn	J740	J720
Kortick		K8086
McGraw-Edison	DP19P6	DP19P5
Utilities Service	36606F-REA	36652

Pins listed below have 4-1/2" offset  
which eliminates the use of Item cs

Chance	C2060271
Joslyn	J25179
McGraw-Edison	DP28P1
Utilities Service	36549

TRANSMISSION

Type	:
Pin Length, inches	: 24
Thread diameter, inches	: 1-3/8
Hole spacing, inches	: 8
REA Specifications	: DT-3
Chance	2196
Joslyn	J824
Kortick	K8087
McGraw-Edison	DP19P8
Utilities Service	36653F

- NOTE 1. Pole top bracket (Item eb) and post insulator (Item ea) may be substituted for pole top pin (Item b) and pin insulator (Item a) for both small and large conductor distribution drawings shown in REA Form 803 at the option of the owner.
2. Flared type pins may be mounted with either side against the pole.

C  
July 1987

c - Bolt, machine

Applicable Specification: ANSI C135.1,  
"Standards for  
Galvanized Steel Bolts and  
Nuts" except that the lengths  
are in the ranges given below.

Applicable Sizes : 1/2 inch diameter, 6 through  
10 inch length

5/8 inch diameter, 6 through  
24 inch length

3/4 inch diameter, 6 through  
26 inch length

7/8 inch diameter, 6 through  
28 inch length

The following manufacturers have shown compliance with the applicable  
specifications for machine bolts:

A. B. Chance Company  
Dixie Electrical Manufacturing Company  
Florida Wire and Cable Supply Division  
Hughes Brothers  
\*Joslyn Manufacturing Company  
Kortick Manufacturing Company  
\*McGraw-Edison  
\*Portland Bolt & Manufacturing Company  
Power Line Hardware  
The Rockford Bolt & Steel Company  
Steel City Bolt & Screw Co., Inc.  
Utilities Service Company



\*\*"Static proof" design available.

d  
July 1987

d - Washers  
FLAT ROLLED STEEL

Size, inches:	2-1/4x2-1/4	3 x 3	4 x 4	4 x 4	1-3/8 round	1-3/4 round
Thickness, in.:	3/16	1/4	3/16	1/2	12 gauge	10 gauge
Hole Diam., in.	13/16	13/16	13/16	13/16	9/16	11/16
C & C Spacer	4					
Chance	6814	6817	6818	6819-1/2	6803	6805
Dixie	D6814	D6817	D6818	D6819-1/2	D6803	-
Hughes	SW2-70	SW3-70	SW4-70	SW4-70(1/2)	RW1-3/8-50	-
Joslyn	J1076	J1079	J1080	J1473	J1086	J1088
Kortick	K1553	K1555	K1557	K1559-1/2	K1524	K1525
McGraw-Edison	DF2W5	DF2W7	DF2W10	DF2W15	DF1W2	DF1W3
Power Line Hardware	SWF225A	SWF33B	SWF44A	-	-	-
Utilities Service	5485	5487A	5488	5490A	5478	5479

CURVED CAST

Size, inches:	2-1/4x2-1/4	3 x 3	3 x 4	4 x 4
Thickness, in.:	1/4	5/16	7/16	1/2
Hole Diam., in.:	11/16	11/16	15/16	13/16
American Connector (A)		CW 33-5	CW 34-7	CW 44-6
Barron Bethea (N)	GCH-1A	GCH-31	CRW-4A	GCH-41
Bethea Metals (A)	AWC-22-5	AWC-33-5	AWC-34-7	AWC-44-6
Bethea Electrical (A)	-	WC-33-5	WC-34-7	WC-44-6
Continental (N)	-	CW-33-5	CW-34-7	CW-44-6
Flagg (MIF)(M)	P141	P143	P120	P144
Power Line Hardware (M)		CSW-33	CRW-34	CSW-44
Universal Electric (A)	UH-225	UH-335	UH-347	UH-446

CURVED ROLLED STEEL

Joslyn (Steel) J114

FLAT CAST

Barron Bethea (N) BB-214  
Flagg (MIF) (N) P56A

SPURRED

3" Round, 3/16" Thick, 13/16" Hole

Continental (N) TCSF-30-6  
Flagg (MIF) (M) PX159A

(A) Aluminum Alloy  
(M) Malleable Iron  
(N) Nodular Iron

f-1  
July 1987

f - Pin, crossarm  
(With square washer, nut and MF locknut)

DISTRIBUTION

Thread (inches diam.)	1	1-3/8	1	1-3/8
Length above base (in.)	5	7	5	7
Length below base (in.)	5-3/4	7	1-1/2	1-3/4
Shank (inches diam.)	5/8	5/8	5/8	3/4

	<u>Long Shank</u>	<u>Short Shank</u>	
Chance	881	4717	886
Dixie	D881	-	-
Joslyn	J203*	J647*	J221*
Kortick	K7104	K7611	K7122
McGraw-Edison	DP2S1*	DP3T1*	DP2S37*
Utilities Service	558	3137A	DP5T22*
		579	3142

Clamp Type Pin

Thread (inches diam.)	1	1-3/8
Length above base (in.)	5-3/4	7
Chance	14322	14322-1
Dixie	D3322	D3324
Joslyn	J3322	J3324
McGraw-Edison	DP2C1	DP2C11



Washer Plate for Clamp Type Pin

These plates are equipped with lugs to prevent slippage of pin along crossarm. They may be used to replace the bottom plate on pins already installed.

Chance	450091
Joslyn	J3322-P
McGraw-Edison	DP9X1

\*\*"Static proof" designs available.

f-2  
July 1987

f - Pin, crossarm  
(With square washer, nut and locknut)

TRANSMISSION

Thread (inches diameter)	1-3/8	1-3/8
Length above base (inches)	10	10
Length below base (inches)	7	1-3/4
Shank (inches diameter)	3/4	3/4
	<u>Long Shank</u>	<u>Short Shank</u>
Chance	4332	-
Joslyn	J610*	J633*
Kortick	K7643	K7635
McGraw-Edison	DP7T9*	DP5T24*
Utilities Service	3140	3145

\* "Static proof" designs available.

<sup>h</sup>  
July 1987

**h - Brace, crossarm, steel**

**Wherever item h is shown on a construction drawing,  
use a brace from page cu.**

July 1987

i - Bolt, carriage

Applicable Specification: ANSI C135.1, "Standards for Galvanized Steel Bolts and Nuts."

Applicable Sizes : 3/8 inch diameter, 3 through 6 inch length

1/2 inch diameter, 3 through 6 inch length

The following manufacturers have shown compliance with the applicable specifications for carriage bolts.

A. B. Chance Company  
Dixie Electrical Manufacturing Company  
Florida Wire and Cable Supply Division  
Hughes Brothers  
Joslyn Manufacturing Company  
Kortick Manufacturing Company  
McGraw-Edison Company  
The Rockford Bolt & Steel Company  
Utilities Service Company



j  
July 1987

j - Screw, lag

Applicable Specifications: Edison Electric Institute Specification TDJ-3 1964, "Standards for Lag Screws"

Applicable Sizes : 1/2 inch diameter, 4 inch length  
1/2 inch diameter, 5 inch length  
5/8 inch diameter, 4 inch length  
5/8 inch diameter, 5 inch length

The following manufacturers have shown compliance with the applicable specifications for lag screws:

A. B. Chance Company  
Dixie Electrical Manufacturing Company  
Joslyn Manufacturing and Supply Company  
Kortick Manufacturing Company  
McGraw-Edison  
Utilities Service Company



k-1  
July 1987

k - Insulators, suspension

<u>ANSI Class</u>	<u>52-9</u>	<u>52-1</u>	<u>52-4</u>	<u>52-3</u>
<u>Type</u>	<u>Clevis</u>	<u>Clevis</u>	<u>Clevis</u>	<u>Ball &amp; Socket</u>
<u>Disc Diameter</u>	<u>4-1/4"</u>	<u>6"</u>	<u>9" or 9-1/2"</u>	<u>9" or 9-1/2"</u>
<u>M &amp; E Rating, lbs.</u>	<u>10,000</u>	<u>10,000</u>	<u>15,000</u>	<u>15,000</u>
<u>Leakage, inches</u>	<u>6-3/4</u>	<u>7</u>	<u>11-1/2</u>	<u>11-1/2</u>
<u>Flashover; kV: Dry-Wet</u>	<u>60 - 30</u>	<u>60 - 30</u>	<u>80 - 50</u>	<u>80 - 50</u>
<u>NOTES</u>	<u>(3)(4)</u>	<u>(3)(4)</u>	<u>(5)</u>	<u>(2)</u>

<u>Manufacturer</u>	<u>Catalog Number</u>			
Chance	C907-1009	C907-1001	-	-
Joslyn (Pinco)	L1814	L1510	L-970	L-960
Lapp	6815-70	6605	9100	9000
Locke	16044	16583	15S410	15S409
Porcelain Prod. (Knox)	84300	86012	-	-
Sediver	CT-4R2-M	-	-	-
Victor Insulators, Inc.	817	804	-	-

Notes:

- (2) To be used only on transmission lines.
- (3) To be used only on distribution lines.
- (4) Use two insulators for 12.5/7.2 kV deadends and three insulators for 24.9/14.4 kV deadends.
- (5) Use two insulators for 24.9/14.4 kV deadends.

k-2  
July 1987

k - Insulators, suspension

<u>ANSI Class</u>	<u>52-3</u>	<u>52-4</u>	<u>52-5</u>	<u>52-6</u>
<u>Type</u>	<u>Ball &amp; Socket</u>	<u>Clevis</u>	<u>Ball &amp; Socket</u>	<u>Clevis</u>
<u>Disc Diameter</u>	10"	10"	10"	10"
<u>M &amp; E Rating, lbs.</u>	15,000	15,000	25,000	25,000
<u>Leakage, inches</u>	11-1/2	11-1/2	11	11
<u>Flashover: kV: Dry-Wet</u>	80 - 50	80 - 50	80 - 50	80 - 50
<u>NOTES</u>	(2)	(1)	(2)	

<u>Manufacturer</u>	<u>Catalog Number</u>
---------------------	-----------------------

ICI (Pinco)	L1060	L1070	L1500	L1570
Lapp	8200	8100	301425	2300
Locke	20S840	20S580	30S255	30S257
Porcelain Prod. (Knox)	81022	81012	-	-
Sediver	-	CT-8R2	-	-

Notes: (1) Use two for 24.9/14.4 kV deadends.  
(2) To be used only on transmission lines.



Conditional List  
k(2)  
July 1987

k - Insulator, Suspension

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Sediver</u>		
10" suspension insulator	997(7/27/72)	To obtain experience.
N-8R2 (ball & socket, 20,000 lbs.)	1068(6/26/75)	
CT-14R2 (clevis, 30,000 lbs.)	1186(5/8/80)	Same as above.
N-14R2 (ball & socket, 30,000 lbs.)	1175(11/2/79) 1297 (4/11/85)	

Conditional List  
k(3)  
July 1987

**k - Insulator, Distribution Deadend**

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Chance</u>		
Distribution deadend Catalog No. C654-0000 "Epoxilator II" (15 kV line-to-line)	965 4/22/71	1. To obtain experience
Catalog No. C654-2500 "Epoxilator II" (25 kV line-to-line)	1082 1/22/76 1129 12/15/77	2. For use as deadends on distribution lines only 3. Recommended maximum working load is 5,000 lbs. 4. Not recommended for use in areas subject to contamination.
<u>Joslyn</u>		
Distribution deadend UDI 671-3002	1074 9/25/75 1088	For use as deadends on distribution lines only up to 15 kV line-to-line voltage.
Distribution deadend UDI 671-3010	4/15/76 1074	
	9/25/75 1088 4/15/76	For use as deadends on distribution lines only up to 25 kV line-to-line voltage.
<u>Lapp</u>		
Distribution deadend Catalog No. 151001, 15 KV Catalog No. 151002, 25 KV	1282 6/21/84	Same as Chance
<u>Tranpol</u>		
Distribution deadend H-15 KV-4 H-25 KV-6	1158 3/1/79 1208 3/19/81	1. To obtain experience 2. For use as deadends on distribution lines only 4. Not recommended for use in areas subject to contamination.

NOTE: When insulators from this page are used, adjust construction drawing material list quantities as necessary.

Conditional List  
k(3.1)  
July 1987

k - Insulator, Distribution Deadend

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Salisbury	1226 (1/7/82)	Same as Chance [See Cond. k(3)]
	9501 Series, 15 KV	
	9502 Series, 25 KV	
Sediver	1304 (8/8/85)	
	1291 (12/20/84)	
	1286 (9/6/84)	Same as Chance [See Cond. k(3)]
ADI-4 15 KV		
ADI-6 25 KV		

NOTE: When insulators from this page are used, adjust construction drawing material list quantities as necessary.

1-1  
July 1987

1 - Clamp, deadend

DISTRIBUTION

Copper 2 through 6 CWC 4A through 8A		ACSR (Aluminum Clamps)			
		4/0 & 3/0	2/0	1/0	2 & 4
-	ALCOA	302	302	302	302
-	American Connector Engineering	QDA-63	QDA-53	QDA-53	QDA-53
MD-52-N	Anderson/Sq.D	PG57N	PG57	PG-46N	PG-46N
-	Bethea Electrical	DA-20N	DA-15-N	DA-15-N	DA-15-N
-	Bethea Metals		ADQ-53	ADQ-53	ADQ-53
-	Continental	AQD-63	AQD-52	AQD-52	AQD-52
-	C & R	CR-20-90	CR-10-90	CR-10-90	CR-10-90
2111	Joslyn	BT5210	J25392	J25389	J25389
-	Lapp	306120N	306118N	306118N	306118N

1-2  
July 1987

1 - Deadend for Steel Strand (Overhead Ground Wire)

TRANSMISSION

For High Strength Steel Strand and Aluminum-Clad Steel Strand

Clamp Type

<u>High Strength Steel</u> <u>Manufacturer</u>	<u>3/8" and 7/16"</u>	<u>Aluminum-Clad Steel</u>		
		<u>7 No. 9 AWG</u>	<u>7 No. 8 AWG</u>	<u>7 No. 7 AWG</u>
Anderson/Sq. D	SWDE-55N			
Bethea Electrical	FD-550-N (For use on 3/8" steel strand only)			

1 - Deadend for steel strand (overhead ground wire)

#### TRANSMISSION

For high strength, extra high strength steel strand and aluminum clad steel strand

#### Compression Type

Manufacturer	High Strength Steel 3/8"	Aluminum-clad steel 7/16"	Extra High Strength 5/16"
	7 No. 9 AWG	7 No. 8 AWG	3/8"
Fargo	861255	861430	861227
Alcoa	4620.12	4627.14	
Burndy	YTW375E	YTW438E	YTW700T
Monac	Order by wire size and type		

#### formed type

	Chance	Helical Line Prod.	Class B galvanizing.	Automatic Type	
	HG210-3/8	HG211-7/16	HG523-12.5M	HG525-16M	HG209-5/16 HG210-3/8 HG211-7/16
Fargo	GDE-303	GDE-302	GDE-302	GDE-303	GDE-301 GDE-302 GDE-303
Reliable	S202	S203	S202	S203	S201 S202 S203

Conditional List  
1(1)  
July 1987

1 - Clamp, deadend

DISTRIBUTION

2-Bolt Straight Line, Aluminum Alloy

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
*American Connector Engineering Aluminum alloy deadend Catalog No. SDA 53 (#4-3/0 ACSR)	1338 (4/2/87)	(a) To obtain experience (b) Applications limited to replacements under hot line conditions.
*Anderson/Square D Aluminum alloy deadend Catalog No. ADS-48-N (2/0 ACSR) Catalog No. ADS-60-N (3/0 ACSR)	1130 (1/5/78) 1148 (9/28/78)	(a) To obtain experience (b) Applications limited to replacements under hot line conditions.
*Barron Bethea Aluminum alloy deadend Catalog No. SDF-10A (4 through 4/0 ACSR)	871 (7/6/67)	Same as above.
*Bethea Electrical Aluminum alloy deadend Catalog No. ASO-684-2 (1/0, 2/0, 3/0 ACSR) Catalog No. ASD-2-N (4-2/0 ACSR) Catalog No. ASD-34-N 3/0, 4/0 ACSR	961 (2/18/71) 1201 (12/4/80)	Same as above.
*Burndy Aluminum alloy deadend Catalog No. CUW26RE-1 #2-2/0 Str. Aluminum #4-2/0 ACSR	1255 (3/24/83)	Same as above.
*Continental Aluminum Alloy deadend Catalog No. HDSO-57 (with side opening) (4-4/0 ACSR) Catalog No. SGA-52-23 (4-2/0 ACSR) Catalog No. SGA-60 (3/0-4/0 ACSR)	1244 (10/7/82)	Same as above

\*Straight line deadend clamps are applicable for urban construction where tensions are moderate and on lines often worked hot.

Conditional List  
1(1.1)  
July 1987

1 - Clamp, deadend

DISTRIBUTION

2-Bolt Straight Line, Aluminum Alloy

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>*C &amp; R Products</u>		
Catalog No. CRDE-10-180 (No. 4 thru No. 2/O ACSR)	918 (5/15/69) 1331 (11/20/86)	(a) To obtain experience. (b) Applications limited to replacements under hot line conditions.
Catalog No. CRDE-20-180 (No. 3/O and No. 4/O ACSR)		
<u>*Fargo</u>		
Aluminum alloy deadend side opening keeper (No. 4 and No. 2 ACSR)	1258 (5/5/83) 1144 (8/3/78)	Same as above.
Catalog No. GD-972A (2/O, 3/O, 4/O ACSR)	791 (4/30/64)	

\*Straight line deadend clamps are applicable for urban construction where tensions are moderate and on lines often worked hot.

m-1  
July 1987

m - Clamp, suspension

2 BOLT - DISTRIBUTION

	Copper & CWC	ACSR with 4	Straight or 2	Formed 1/0 & 2/0	Armor Rods 3/0 & 4/0
American Connector	FLS-53	ALS-62	ALS-62	ALS-86	ALS-105
Anderson/Square D	MS-46-N	MS-60-N	MS-70-N	HAS-85-N	HAS-104-N
Barron Bethea	FWG-1	FWG-2	FWG-3	FWG-4	-
Bethea Electrical	FS-46-N	GW-1-N	LS-0-N	LS-1-N	LS-2-N
Brown Boveri Elec.	6240	6241	6242	6243	6244
C & R Products	-	-	-	CRSC-1	CRSC-2
Continental Electric	FSC-46-N	FSC-60-N	SC-70-N	SC-85-N	SC-105-N
Dulmison	-	-	-	-	AGS*
Joslyn (Brewer Titchener)	6240	6241	6242	6243	6244
Lapp	305740N	306027N	306028N	306029N	306030N
Preformed	-	-	-	-	AGS*

\*Accepted for larger sizes.

m-2  
July 1987

m - Clamp, Suspension

ANGLE - DISTRIBUTION  
No. 2 & 4 ACSR  
Plus Rods

2-BOLT TRANSMISSION  
For 3/8" Steel Overhead  
Ground Wire

-	American Connector	FLS-53
AAC-68-90	Anderson/Square D	MS-46-N
-	Barron Bethea	FGW-1
RALS-1	Bethea Electrical	FS-46-N
AC-75	Continental	FSC-46N
GD-907A	Fargo	-
2300	Brown Boveri Electric	6240
2300	Joslyn (Brewer-Titchener)	6240
306092	Lapp	305740N
AC-60	Power Line Hardware	-

<sup>n</sup>  
July 1987

n - Bolt, double arming

Applicable Specification: ANSI C 135.1, "Standards for Galvanized Steel Bolts and Nuts."

Applicable Sizes : 5/8 inch diameter, 12 inch through 24 inch length

3/4 inch diameter, 20 inch through 24 inch length

The following manufacturers have shown compliance with the applicable specifications for double arming bolts:

A. B. Chance Company  
Dixie Electrical Manufacturing Company  
Florida Wire and Cable Supply Division  
Hughes Brothers  
\*Joslyn Manufacturing and Supply Company  
Kortick Manufacturing Company  
\*McGraw-Edison  
Portland Bolt & Manufacturing Company  
Power Line Hardware  
Steel City Bolt & Screw Co., Inc.  
Utilities Service Company



\*"Static proof" designs available.

O  
July 1987

O - Bolt, eye, oval

Applicable Specification: ANSI C135.4, "Standards for Galvanized ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes : 5/8 inch diameter, 6 inch through 20 inch length

3/4 inch diameter, 8 inch through 20 inch length

The following manufacturers have shown compliance with the applicable specifications for oval eye bolts:

Berny's Forging Company  
A. B. Chance Company  
Dixie Electrical Manufacturing Company  
\*Joslyn Manufacturing Company  
Kortick Manufacturing Company  
\*McGraw-Edison  
Power Line Hardware  
Utilities Service Company

\*"Static proof" designs available.



Shoulder Eye Bolt  
for Transmission Structures

3/4 inch diameter, 8 inch through 20 inch length

Catalog Number

Joslyn  
Kortick

J9528 to J9540  
K9558 to K2570

p-1  
July 1987

p - Connectors, Distribution (Parallel Groove)

Applicable Specification, "REA Specification for Connectors," DT-8

		ACSR to ACSR To same size or smaller Bare Conductor			
		4/0 - 2/0	1/0	2	4
Alcoa	190	396.6	490.0	490.0	
Anderson/Sq. D	LC-53A	LC-51C	LC-51A	LC-51A	
Bethea Electrical	APG-3	APG-2	APG-1	APG-1	
Blackburn	PAE 4141-9	PAE 2121-9	PAE 2121-9	PAE 2121-9	
Burndy	KVS28A	UCG25R	UC25R2R	UC25R2R	
Electrical Specialty Products, Inc.	PG-53A	PG-51C	PG-51C	PG-51C	
Fargo	GA-614	GA-620	GA-620	GA-620	
Joslyn	6053	6052	6052	6052	
Penn-Union	PCAA-20BF	PCAA-15BF	PCAA-10BF	PCAA-10BF	
Reliable	6053	6052	6052	6052	
Weaver	NICA12	NICA60	NICA2	NICA2	
Over Armor Rods					
	3/0	2/0	1/0	2	4
Alcoa	200	R196	R196	R196	198
Anderson/Sq. D	LC-83A	LC-52C	LC-52C	LC-52C	LC-52C
Blackburn	-	-	PAA10	PAA10	PAA10
Burndy	-	-	UC32R	UC32R	UC32R
Electrical Specialty Products, Inc.	-	-	PG-52C	PG-52C	PG-52C
Fargo	GA-9843	GA-9842	GA-616	GA-616	GA-616
Joslyn	-	-	744AL	600AL	600AL
Penn-Union	-	-	ARC-12	ARC-11	ARC-14
Reliable	-	-	744AL	600AL	600AL
Weaver	-	-	NICR60	NICR60	NICR60

p-2  
July 1987

p - Connectors, Distribution (Parallel Groove)

Applicable Specification: "REA Specification for Connectors," DT-8

ACSR to Copper or Copperweld-Copper

ACSR Size (Bare Conductor)

	3/0	2/0	1/0	2	4
Alcoa	197	R193	R193	195	195
Anderson/Sq. D	LC-811A	LC-811A	LC-522A	LC-511A	LC-511
Blackburn	PAC7	PAC7	PAC4	2CA	4CA
Fargo	GA-616C	GA-616C	GA-620C	GA-620C	GA-620C
Joslyn	600ALC	555ALC	438ALC	438ALC	438ALC
Reliable	600ALC	555ALC	438ALC	438ALC	438ALC

ACSR Size (Over Armor Rods)

	3/0	2/0	1/0	2	4
Alcoa	201	R197	R197	R197	199
Anderson/Sq. D	LC-833	LC-833	LC-811A	LC-811A	LC-811
Blackburn	-	-	PAC7	PAC7	PAC7
Fargo	GA-9843C	GA-9842C	GA-616C	GA-616C	GA-616C
Joslyn	-	-	744ALC	600ALC	600ALC
Reliable	-	-	744ALC	600ALC	600ALC

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July 1987

p - Connector, Distribution

Applicable Specification: "REA Specification for Connectors," DT-8

C'Weld Copper Copper	<u>Copper Type Conductors</u>				
	<u>Connections to same size or smaller</u>				
	2A 0x7	4A 2x3	6A 4	8A 6	
<u>Bare Conductor</u>					
Anderson/Sq. D	DG-1/0	DG-1	DG-2	DG-4	DG-6
(s) Blackburn	1/OH	1H	2H	4H	6H
(s) Burndy	KS-25	KS-23	KS-23	KS-20	KS-17
(s) Dossert	DS-10-F	DS-6-F	DS-6-F	DS-3-F	DS-2-F
Fargo	GC-5020	GC-5002S	GC-5002	GC-5004	GC-5006
(s) Frankel	B-1/0	B-2	B-3	B-4	B-6
(s) Greaves	-	A-8	-	A-5	A-3
(s) ILSCO	IK-1/0	IK-2	IK-2	IK-4	IK-6
(s) Joslyn	-	IF	2F	4F	6F
(s) Kearney	118109	118109	118108	118104	118102
(s) Krueger & Hudepohl	UC58C-EV	-	-	-	-
(s) Penn-Union	S1/0	S2	S3	S4	S6
(s) Reliable	-	1F	2F	4F	6F
ITT Royal	1739	1739	-	-	-
(s) Sherman	TS1/0	TS2ST	TS-2	TS-4	TS-6
(s) Weaver	10W	1W	2W	4W	6W
<u>Over Armor Rods</u>					
Anderson/Sq. D	K-5	K-4	K-4	K-2	K-2
Blackburn	2B350	2B350	2B4/0	2B2/0	2B1/0
Burndy	KVS-31	KVS-31	KVS28	KVS26	KVS26
Fargo	GC-5035	GC-5035	GC-5040	GC-5020S	GC5020
ILSCO	IKB-350	IKB-350	IKB-4/0	-	-
(s) Kearney	118112	118112	118111	118110	118110
Penn-Union	VT-4	VT-3	VT-3	VT-2	VT-1
Weaver	350CX	350CX	4/0CX	2/0CX	1/0CX

(s)designates split bolt connectors

	<u>Long Connectors (Split Bolt)</u>		
	<u>Copper to Copper</u>		
Anderson/Sq. D	2 C-2-L	4 C-4-L	6 C-6-L
Blackburn	2H3	4H3	6H3
Burndy	KS-22-3	KS-20-3	KS-17-3
Dossert	DS5-3	DS3-3	DS2-3
Greaves	A-9	A-6	A-4
Joslyn	-	4-F	6-F
Kearney	118107	118105	118103
Penn-Union	SEL-3	SEL-4	SEL-6
Reliable	-	4F	6F
Sherman	-	TSS-4	TSS-6
Weaver	2W3	4W3	6W3

p - Connectors, Service (Parallel Groove)

Applicable Specification, "REA Specification for Connectors," DT-8

Aluminum-to-Aluminum

Solid or Stranded

	<u>No. 2</u>	<u>No. 4</u>
Alcoa	490.0	490.0
Anderson/Sq. D	LC-51A	LC-51A
Bethea Electrical	APG-1	APG-1
Blackburn	PAE 2121-9	PAE 2121-9
Burndy	UC25R2R	UC25R2R
Electrical Specialty Products, Inc.	PG-51C	PG-51C
Fargo	GA-620	GA-620
Joslyn	AL24KK	AL46KK
Penn-Union	PCAA-10BF	PCAA-10BF
Reliable	AL24KK	AL46KK
Weaver	NICA2	NICA2

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July 1987

p - Connectors, Service (Parallel Groove)

Applicable Specification: "REA Specification for Connectors," DT-8

Aluminum-to-Copper

Solid or Stranded

	2 Al to <u>4 Cu</u> R193	4 Al to <u>6 Cu</u> 195
Alcoa		
Anderson/Sq. D	LC-511A	LC-511A
Blackburn	PAC345	PAC345
Fargo	GA-620C	GA-620C
Joslyn	AL24UU	AL46UU
Reliable	AL24UU	AL46UU

p - Connectors, Service

Applicable Specification, "REA Specification for Connectors," DT-8

Copper-to-Copper

Solid or Stranded

<u>Manufacturer</u>	<u>No. 4</u>	<u>No. 6</u>
Anderson/Sq. D	4E	6ES
Blackburn	4N	6N
Burndy	KP4C	KP6C
Dante	SE-3	SE-2
Dossert	ES-4	ES-6
Fargo	GC-5004	GC-5006
Ilsco	SX-4	SX-6
Joslyn	R46	R68
Penn-Union	SX4	SX6
Reliable	R-46	R-68
Sherman	--	SC6X
Weaver	4SE	6SE

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July 1987

p - Connectors, Guy Bond (Parallel Groove)

Applicable Specification: "REA Specification for Connectors," DT-8

ACSR to Guy Strand

	2/0	1/0	2 & 4
Alcoa	396.6	396.6	490.0
Anderson/Sq. D	LC-52A-GP	LC-51C-GP	LC-51A-GP
Bethea Electrical	APG-3	APG-2	APG-2
Blackburn	PAE 2121-9	PAE 2121-9	PAE 2121-9
Burndy	UC 28R	UCG25R	UCG25R
Dossert	AC103-LW	AC101-LW	AC100-LW
Electrical Specialty Products, Inc	PG-52A-GP	PG-51C-GP	PG-51C-GP
Fargo	GA-616	GA-620	GA-620
Joslyn	744AL	555AL	438AL
Penn-Union	ALC-15	ALC-10	PCA-010
Reliable	744AL	555AL	438AL
Weaver	NICR60	NICA60	NICA60

Copper to Guy Strand

Anderson/Sq. D	LC-511A
Blackburn	2HPW (1/4") 1/0HPW (3/8") PAC7
Burndy	UC8W26L
C & R	CRJC-1
Dossert	UDV 13-1-P
Fargo	GC-8040P
ILSCO	SK-3 (1/4") SK-1/0 (3/8")
Joslyn	J8300
Kearney	9968-1
Krueger & Hudepohl	UC58B-EV
Penn-Union	JC-1-AC (1/4", 3/8" guy strand) (1/0 strand copper max.)
Reliable	438ALC
Sherman	R-12
Weaver	K-1

p - Connectors, Compression

DISTRIBUTION

	<u>Aluminum to aluminum</u>	<u>Aluminum to copper</u>	<u>Copper to copper</u>	<u>Tap Connections (Al to Al, Al to Cu)</u>
Anderson/Sq. D	AC Series	AC Series	VCUC	VCP
Blackburn	Type WR	Type WR	Type CF	Type WR
Burndy	"Hycrimp"	"Hycrimp"	"Crimpit"	"Cabelok Crimpit"
Electrical Specialty	"Squeeze Conn" (Type S)	"Squeeze Conn" (Type S)	-	-
Homac	H Tap-OB&DB	H Tap-OB&DB	-	H Tap-OB&DB
Kearney	"Squeezeon" (Aluminum)	"Squeezeon" (Aluminum)	"Squeezeon" (Copper)	"Squeezeon" (Aluminum)
Penn-Union	"Press-On" (Aluminum)	"Press-On" (Aluminum)	"Press-On" (Copper)	"Penn-L-Tap"

p-9  
July 1987

p - Connectors, Compression

SERVICE

	<u>Aluminum-to-Aluminum</u>	<u>Aluminum-to-Copper</u>	<u>Copper-to-Copper</u>
Alcoa	"SECS"		-
Anderson/Sq. D	VAUS		VCCS
Blackburn	CS, KL		-
Burndy	"Linkits"		YDS-C, YDS-W
Electrical Specialty	VSE		-
Homac	"Shure Splicers"		-
Kearney	"Serv-ens"		-
National Tel. Supply	"Nicopress"		-
Penn-Union	"Penn Sleeves"		-

These connectors are furnished in a variety of sizes to fit all combinations of aluminum and copper service wire.

## p - Connectors, Transmission

## BOLTED TYPE

**Applicable Specification:** "REA Specification for Connectors," DT-8

ACSR to ACSR  
ACSR to Copper

Alcoa

## 580 Series

## Burndy (ACSR to ACSR)

UP-A, UP-R



**When ordering these clamps specify size, stranding and material of both conductors.**

### **Compression Type**

## ACSR to ACSR Same Size



<u>Conductor Size</u>	<u>Alcoa</u>	<u>Anderson</u>	<u>Burndy</u>	<u>Kearney</u>	<u>ITT Blackburn</u>
1/0	5074.438	VPUS	YCS25R	OHR-1/0-61AJ	RCJ10
2/0	5074.484	-	YCS26R	OHR-2/0-61AJ	RCJ20
3/0	5075.547	Order	YCS27R	OHR-3/0-61AJ	RCJ30
4/0	5075.609	by	YCS28R	OHR-4/0-61AJ	RCJ40
266.8 kcmil	5076 Order by	Conductor	YCS30R	HR-266-267AJ	RCJ266M
336.4 kcmil	5076 stranding	Size	YCS33R	HR-336-267AJ	RCJ336M

## ACSR to Copper

Alcoa 5070 Series  
Anderson/Sq. D VPUS  
Burndy YCR-R-CA

(Order by conductor sizes)

p-11  
July 1987

p - Connectors

(wedge type)

<u>Manufacturer</u>	<u>Aluminum-to-aluminum</u>	<u>Aluminum-to-copper</u>	<u>Copper-to-copper</u>	<u>Tap Connections (Al to Al, Al to Cu)</u>
AMP	"Ampact" (Aluminum)	"Ampact" (Aluminum)	"Ampact" (Copper)	"Ampact" (Aluminum)
Connector Products, Inc.	Aluminum Tap Connector	Aluminum Tap Connector	---	Aluminum Tap Connector
UTM	"Wrench-Lok"	"Wrench-Lok"	--	"Wrench-Lok"

Conditional List  
p(1)  
July 1987

**P - Connectors**

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Anderson/Square D</u> Compression al to al al to cu "Versa-Crimp" L tap.	748 11/1/62	To obtain experience
<u>Parallel groove, aluminum</u> LC-52C (1/0 - 6/1 ACSR over armor rods) LC-51C (1/0 - 6/1 ACSR)	738 6/21/62	" " "
<u>Burndy</u> Compression, insulated "Insulink"	672 8/6/59	" " "
<u>Blackburn</u> Compression, insulated service entrance con- nectors, Types ICS-1 and IKL	1027 10/11/73 1133 2/16/78	" " "
Bolted, insulated IPC 1102 (#2-1/0 run, #2 tap) IPC 4111 (1/0-4/0 run, #2-1/0 tap) IPC 4141 (1/0-4/0 run, 1/0-4/0 tap)	1327 9/11/86 1330 10/30/86	<ol style="list-style-type: none"> <li>1. For use on 600 volt maximum insulated conductors.</li> <li>2. To be used only for connecting service drop conductors to service entrance conductors.</li> <li>3. To obtain experience.</li> </ol>
<u>Homac</u> Compression, Insulated "Shure Splicers" Types Q1N and U1N	1074 9/25/75 1269 11/17/83	" " "

## Conditional List

p(2)  
July 1987**p - Connectors**

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Kupler</u> Bolted, insulated 130001 (#2-1/0 run, #2 tap) 130003 (1/0-4/0 run, #2-1/0 tap) 130004 (1/0-4/0 run, 1/0-4/0 tap)	1306 (9/26/85)	<ol style="list-style-type: none"><li>1. For use on 600 volt maximum insulated conductors.</li><li>2. To be used only for connecting service drop conductors to service entrance conductors.</li><li>3. To obtain experience.</li></ol>
<u>Penn Union</u> Compression, Insulated Type PIK	866 2/8/68	To obtain experience.
<u>Utilco</u> Two bolt style, al to al Type PM	1053 11/14/74	" " "

q  
July 1987

q - bolt, double upset



Applicable Specification: "REA Specifications for Single and Double Upset Spool Bolts," D-5

Diameter, inches	5/8 <u>7</u>	5/8 <u>8</u>	5/8 <u>9</u>	5/8 <u>10</u>
Chance	-	7826	7828	7830
Dixie	07824	07826	07828	07830
Joslyn	-	J2394	J2395	J2396
Kortick	K4760	K4761	K4762	K4763
McGraw-Edison*		DC3E11	DC3E12	DC3E13
Utilities Service	31065	31067	31069	31071

\*Static proof designs available.

S  
July 1987

s - Clevis, secondary swinging

Applicable Specifications: REA Specifications for Secondary Swinging Clevises, D-6

<u>Manufacturer</u>	<u>Clevis only*</u>	<u>Clevis with 1-3/4" groove spool</u>	<u>Clevis with 3" groove spool</u>
Chance	0352	0352-C909-1032	0352-C909-1034
Dixie	D0352	-	-
Joslyn	J0322	J0392	J0393
Kortick	K9259	K9109	K9149
McGraw-Edison	DC4S1	DC4S14	DC4S13
Utilities Service	32043	36043	32143

\*Catalog Number does not include spool. See page cm for spool type insulators.

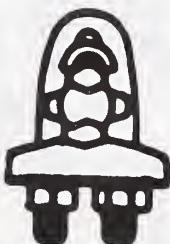
U - Deadend for galvanized steel or  
alumoweld guy strand



3-Bolt Guy Clamp

	<u>Light</u> (1/2" bolts)	<u>Heavy</u> (5/8" bolts)*
Chance	6450	6461
Dixie	D6450	D6461
Joslyn	J930	J931
Kortick	K4124	K4005
McGraw-Edison	DG3C2	DG3C3
Util. Service	5273	5275

U-Bolt Guy Clamp



	<u>Light</u> (3/8" bolts)	<u>Heavy</u> (1/2" bolts)
Barron Bethea	GCU-38C	-
Continental	GC-64C	GC-67C
Flagg (MIF)	PAX-64C	PAX-67C

Offset Guy Clamp

	<u>Light</u> (1/2" bolts)	<u>Heavy</u> (5/8" bolts)
Chance	6409	6410
Joslyn	J926	J927

\*For use on transmission.

**u - Deadend for galvanized steel guy strand**

Strand Size:	1/4"	9/32"	Automatic	5/16"	3/8"	7/16"
<b>Fargo Ball for thimble eye</b>	GDE-300	GDE-301		GDE-301	GDE-302	GDE-303
<b>Reliable Ball for thimble eye</b>	\$100 Ball for guy insulator	\$201 \$251		\$201 \$251	\$102 \$152	\$103 \$153



**formed types**

<b>Chancis for standard guy" for wrapped guy</b>	1/4 CTLG 1/4 GSC-C	9/32 CTLG 9/32 CTLG-C	S/16 CTLG S/16 GSC-C	3/8 CTLG 3/8 GSC-C	7/16 CTLG 7/16 GSC-C
<b>Helical Line Products for standard guy"</b>	HG-207-1/4"	HG-208-9/32"	HG-209-5/16"	HG-210-3/8"	HG-211-7/16"
<b>Preformed Line Products for standard guy" for wrapped guy</b>	GDE-1104 WGL-2100	GDE-1105 WGL-2101	GDE-1106 WGL-2102	GDE-1107 WGL-2103	GDE-1108 WGL-2104

\*Class B galvanizing. When guy wire has Class C galvanizing, formed deadend should also have Class C galvanizing.



u - Deadend for aluminoweld guy strand

Strand Size                    3#10(4M)    7#12(6M)    7#11(8M)    7#10(10M)    7X.110"(11.5M)    7#9(12.5M)    7X.121"(14M)    7#8(16M)    7X.148"(20M)

Formed TypeAluminoweld Guy StrandChancéfor standard guy

6M-AWTLG    8M-AWTLG    10M-AWTLG

HelicalLine Productsfor standard guy

HG517-6M    HG519-8M    HG521-10M

Preformed LineProductsfor standard guy

AWDE-4108    AWDE-4110    AWDE-4113    AWDE-4116    AWDE-4118

WGL-4110    WGL-4113    WGL-4116    WGL-4120

AutomaticAluminoweld Guy StrandFargo

GDE-300    GDE-301    GDE-301

Reliable

S200    S201    S201

HG525-16M

HG528-20M

HG523-12.5M

HG524-14M

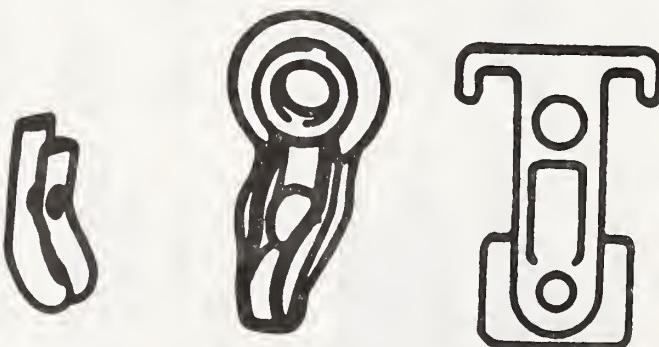
HG525-16M

HG528-20M

v  
July 1987

v - Guy Attachment  
for 5/8" bolt

Type:	Formed Strap	Angle Bolt Eye	Guy Hook	Pole Eye Plate
Maximum Working Load Rating	23,130 N (5200 lbs.)	23,130 N (5200 lbs.)	23,130 N (5200 lbs.)	37,800 N (8500 lbs.)
Anderson Elec./Square D	-	-	-	GSP-05
Barron Bethea	-	-	GH-5*-	-
Bethea Metals	-	-	AGA56* AGA-56X*	FPE5-6
Bethea Electrical	-	-	AG-5*	PES-6A
Champ	-	-	CH58GH*	CH21PE
Chance	5004	0100	C203-0168*	-
Continental Electric	-	-	GAD-56-4*	PEP-66-45
Dixie	D5004	D0100	DD-9460, DD-9462*	-
Flagg (MIF)	-	-	P151A, P151X*	PX88
Joslyn	J25164	J6500	J6555, J6556	-
Kortick	K4035, K4047	K3140	-	-
McGraw-Edison	DG6H1	DG11E1	DG21H1	-
			DG21H2	
Power Line Hardware	-	-	HGA-58C*	PGA-548
Universal Electric	-	-	UGA56*	-
Util. Service	31030	5531	-	-



\*This hook may also be used in place of the wrapped guy arrangement in assemblies E3-2 and E3-3.

Conditional List  
v  
July 1987

v - Guy attachment

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Joslyn</u>		
Pole Band, with cone head bolt, J-6281 and guy clip J-6275	745 8/16/62	To obtain experience. For distribution lines only and 10,000 lbs maximum loading.
J-6280 (for 6" to 10" pole)		
J-6270 (for 8" to 14" pole)		

<sup>w</sup>  
July 1987

w - Insulators, guy strain  
(Fiber Reinforced Plastic)

Ult. Strength, pounds	11,000	15,000	21,000
<u>Barron Bethea</u>	BB-11-CC Series	BB-15-CC Series	BB-21-CC Series
<u>Bethea Electrical Products</u>	FGS16 Series	FGS16 Series	FGS21 Series
<u>Continental</u>	G-11 Series	G-15 Series	G-21 Series
<u>Flagg (MIF)</u>	150 Series	150 Series	210 Series
<u>Hughes Brothers</u>	-	992 Series	994 Series
<u>Joslyn-Empire</u>	400 Series	500 Series	650 Series
<u>McGraw-Edison</u>	-	DEG 15 Series	DEG 30 Series
<u>Tranpol</u>	HSI1-1P Series	HSI-2X Series	HSI3-1P Series

X  
July 1987

X - Rod, anchor

**Applicable Specification:** ANSI C135.2, "Standards for Galvanized Ferrous Strand Eye Anchor Rods."

**Applicable Sizes:** Single guy - 5/8 inch diam. 6, 7 and 8 feet long  
- 3/4 inch diam. 8, 9 and 10 feet long  
- 1 inch diam. 9 and 10 feet long

Double guy - 5/8 inch diam. 7 and 8 feet long  
- 3/4 inch diam. 8, 9 and 10 feet long  
- 1 inch diam. 9 and 10 feet long

Single Guy Drive - 5/8 inch diam. 7 and 8 feet long  
- 3/4 inch diam. 8, 9 and 10 feet long  
- 1 inch diam. 9 and 10 feet long

Double Guy Drive - 5/8 inch diam. 7 and 8 feet long  
- 3/4 inch diam. 8, 9 and 10 feet long  
- 1 inch diam. 9 and 10 feet long

The following manufacturers have shown compliance with the applicable specifications. Some manufacturers cannot supply all sizes listed above. Check with manufacturer or distributor for availability.

Carolina Galvanizing	Knight
Chance	Kortick
Dixie	McGraw-Edison
Grip-Tite	Utilities Service
Joslyn	



y-1  
July 1987

y - Galvanized Steel Strand  
Applicable Specification: ASTM A475 (Class A, B or C Coating)

Grade Size	Siemens Martin			High Strength (HS)			Extra High Strength (EHS)		
	1/4"	3/8"	7/16"	9/32"	5/16"	7/16"	1/4"	9/32"	5/16"
DISTRIBUTION GUY STRAND									
Manufacturer	x	x	x	x	x	x	x	x	x
Alcan Cable	x	x	x	x	x	x	x	x	x
Armco Steel Corp.	x	x	x	x	x	x	x	x	x
Bekwart Steel & Wire Corp.	x	x	x	x	x	x	x	x	x
Bethlehem Steel	x	x	x	x	x	x	x	x	x
Bridon American Corp.	x	x	x	x	x	x	x	x	x
CF & I	x	x	x	x	x	x	x	x	x
Cal-Wire	x	x	x	x	x	x	x	x	x
Davis Walker	x	x	x	x	x	x	x	x	x
Florida Wire and Cable	x	x	x	x	x	x	x	x	x
Indiana Steel and Wire	x	x	x	x	x	x	x	x	x
National Strand Products	x	x	x	x	x	x	x	x	x
Paulsen Wire Rope Corp.	x	x	x	x	x	x	x	x	x
Seal Wire Co.	x	x	x	x	x	x	x	x	x
Southwire	x	x	x	x	x	x	x	x	x
Texstrand	x						x		

Note: The buyer should specify Class A, B or C coating per ASTM Specification A475.

y - Galvanized Steel Strand

Applicable Specification: ASTM A475 (Class A, B or C Coating)

TRANSMISSION GUY STRAND

<u>Grade</u> <u>Size</u>	<u>High Strength (HS)</u> <u>1/4"</u>	<u>High Strength (HS)</u> <u>9/32"</u>	<u>High Strength (HS)</u> <u>5/16"</u>	<u>High Strength (HS)</u> <u>3/8"</u>	<u>High Strength (HS)</u> <u>7/16"</u>	<u>Extra High Strength (EHS)</u> <u>1/4"</u>	<u>Extra High Strength (EHS)</u> <u>9/32"</u>	<u>Extra High Strength (EHS)</u> <u>5/16"</u>	<u>Extra High Strength (EHS)</u> <u>3/8"</u>	<u>Extra High Strength (EHS)</u> <u>7/16"</u>
<u>Manufacturer</u>										
Alcan Cable	x		x	x		x		x	x	x
Armco Steel Corp.	x		x	x		x		x	x	x
Bekkaert Steel Wire Corp.	x		x	x		x		x	x	x
Bethlehem Steel	x		x	x		x		x	x	x
Bridon American Corp.	x		x	x		x		x	x	x
CF & I	x		x	x		x		x	x	x
Cal-Wire	x		x	x		x		x	x	x
Davis Walker	x		x	x		x		x	x	x
Florida Wire and Cable	x		x	x		x		x	x	x
Indiana Steel and Wire	x		x	x		x		x	x	x
National Strand Products	x		x	x		x		x	x	x
Paulsen Wire Rope Corp.	x		x	x		x		x	x	x
Seal Wire Co.	x		x	x		x		x	x	x
Southwire	x		x	x		x		x	x	x
Texstrand	x					x				x

Note: The buyer should specify Class A, B or C coating per ASTM Specification A475.

y-3  
July 1987

y - Galvanized Steel Strand  
Applicable Specification: ASTM A363 (Class A, B or C Coating)

		OVERHEAD STATIC WIRE			
Grade	Size	High Strength (HS) 3/8"	7/16"	Extra High Strength (EHS) 5/16"	3/8" 7/16"
Manufacturer					
Alcan Cable	x	x		x	x
Armco Steel Corp.	x	x	x	x	x
Bekaert Steel Wire Corp.	x		x	x	
Bethlehem Steel	x	x	x	x	x
Bridon American Corp.	x	x	x	x	x
CF & I	x	x	x	x	x
Cal-Wire	x	x	x	x	x
Davis-Walker	x	x	x	x	x
Florida Wire and Cable	x	x	x	x	x
Indiana Steel and Wire	x	x	x	x	x
National Strand Products	x	x	x	x	x
Paulsen Wire Rope Corp.	x		x	x	x
Seal Wire Co.	x	x	x	x	x
Southwire	x	x	x	x	x

Note: The buyer should specify Class A, B or C coating per ASTM Specification A363.

Conditional List

y  
July 1987

y - Al-Zn Alloy Coated Steel Wire  
Applicable Specification: ASTM A785 (Classes 30 & 45)  
Condition of Acceptance - To obtain experience

Distribution Guy Strand

Grade	Siemens Martin					High Strength					Extra High Strength				
Size	1/4"	3/8"	7/16"	1/4"	9/32"	5/16"	3/8"	7/16"	1/4"	9/32"	5/16"	3/8"	7/16"		

Bethlehem	X	X	X	X	X	X	X	X	X	X	X	X	X
Steel													

Transmission Guy Strand

Grade	High Strength					Extra High Strength				
Size	1/4"	9/32"	5/16"	3/8"	7/16"	1/4"	9/32"	5/16"	3/8"	7/16"

Bethlehem	X	X	X	X	X	X	X	X	X	X
Steel										

(Purchaser should specify class 30 or class 45)

z-1  
July 1987

**z - Anchors, Expanding and Plate**

**DISTRIBUTION**

Designated Maximum holding power-lbs.	6000	8000	10,000	12,000
Min. Area - sq. in.	90	100	120	135
Rod Dia. - inches	5/8	5/8	3/4	3/4
Rod Length - feet	7	7	8	-

	<u>Type</u>	88135	88135	88135	88135
Chance	8 way				
Dixie	4 way Plate	D88100-G -	D88115-G D7502-G	D88135-G -	D88135-G D7504-G
Everstick	3 way 4 way	834 -	836 -	8310 84-3/4	- -
Grip-Tite	8 way	A322086G	A322088G	A322812G	A322812G
Joslyn	8 way Plate	J8100-G -	J8115-G J7502-G	J8135-G J7503-G	J8135-G J7504-G
McGraw-Edison	4 way	DA1E5	DA1E6	DA1E6	DA1E7
Power Line Hardware	8 way	8-100G	8-115G	8-135G	8-135G
South Central	8 way	-	84115AG	84135AG	84135AG
Utilities Service	8 way Plate	C88100-G -	C88115-G C617-G	C88135-G C622-G	C88135-G C822-G

**NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.**

z-2  
July 1987

**z - Anchors, plate**

Applicable Specification: "REA Specification for Steel Plate Anchors," T-3

**TRANSMISSION**

Minimum Area 400 sq. in.

<u>Chance</u>	X24 - 3/4
<u>Grip-Tite</u>	XP24 - 3/4 - G
<u>Joslyn</u>	J3524 - 3/4 - G
<u>McGraw-Edison</u>	DA4P7 - 3/4 - G
<u>Power Line Hardware</u>	CP-24G

**NOTE:**

Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

z-3  
July 1987

**z - Anchors, Service**

**Designated Maximum Holding Power in Sand - 2500 lbs.**

	<u>Screw</u>	<u>Expanding</u>
Chance	6346	6870
Dixie	D-6526	-
Grip-Tite	-	322065G
Joslyn	J6526H-CA	J0870-G
McGraw-Edison	DA2N1	-
Power Line Hardware	-	8-70G
Utilities Service	C6346-G	PL62-2.5-G

**z - Anchors, Swamp**

**DISTRIBUTION**

	<u>10" dia.</u>	<u>12" dia.</u>	<u>15" dia.</u>
Chance	10150AS	132AS	152AS
Dixie	D-6710-S	D-6713-S	D-6715-S
Joslyn	J2871SG	J2872SG	J2873SG
Utilities Service	C10150A-G	C122A-G	C152A-G

**NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.**

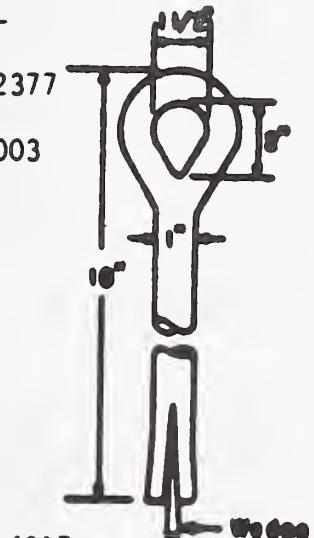
z-4  
July 1987

z - Anchors, Rock

	Expanding Rock Anchors			Rock Guy Bolt
Anchor Size - inches	1-3/4	1-3/4	1-3/4	1-3/4
Rod Length - inches	15	30	53	18
Rod Diameter - inches	3/4	3/4	3/4	1
Chance	R315	R330	R353	-
Joslyn	J3436	J3437	J3438	-
Kortick	K5503	K5504	K5505	K2377
Utilities Service	CR315	CR330	CR353	5003



z - Pole keys



Chance

P-4817

Joslyn

J-4817

Utilities Service

CP-4817

z-5  
July 1987

Z - Anchors, Power-installed screw

Manufacturer:

A. B. Chance Company

"SS" Multi Helix Anchors

Working Load Categories

Soil Type	35,600 N (8,000 lb.)	53,400 N (12,000 lb.)	71,000 N (16,000 lb.)	89,000 N (20,000 lb.)
A1	12642-AE	12642-AE	12642-AEJ	12642-AEJ
Soil Class 2	12642-AEJ	12642-AEJ	12642-EJN	12642-EJN
A2	12642-EJN	12642-EJN	12642-EJNS	12642-EJNS
Soil Class 3	12642-AE	12642-AE	12642-AEJ	12642-EJN
Classes 4 & 5	12642-AEJ	12642-AEJ	12642-EJN	12642-EJNS
Soil Classes 6 & 7	12642-EJN		12642-EJNS	
C	12642-AEJ	12642-EJN	12642-EJNS	
Soil Classes 6 & 7	12642-EJN			

Manufacturer:

Joslyn

"PS" Screw Anchors

Working Load Categories

Soil Type	35,600 N (8,000 lb.)	53,400 N (12,000 lb.)	71,000 N (16,000 lb.)	89,000 N (20,000 lb.)
A1	J24991ACA	J24991ACA	J25534ACAB	J25534ACAB
Soil Class 2	J23381ACA	J23381ACA	J25535ACAB	J25535ACAB
A2	J23383ACA	J23383ACA	J25533ACAB	J25533ACAB
Soil Class 3	J24991ACA	J24991ACA	J23381ACA	J23383ACA
Classes 4 & 5	J23381ACA	J23381ACA	J23383ACA	J23384ACA
B	J23383ACA	J23383ACA	J23384ACA	
Soil Classes 6 & 7	J24991ACA	J23381ACA	J23381ACA	J23384ACA
C	J23381ACA	J23383ACA	J23384ACA	
Soil Classes 6 & 7	J23383ACA			

NOTES: 1. See REA Specification T-10 for definitions and explanations.

2. Anchors in the 53,400 N (12,000 lb.) category or above for use on wood poles must be used with hardware commensurate with the working load. Hardware may provide for either single or multiple guy attachments to the anchor.
3. Anchors listed in a specific working load category and/or soil class may generally be used at lower working load categories and/or lower numerical soil classes.

z - Anchors, Power-installed screw

Manufacturer: Dixie Electrical Manufacturing Company  
Multi-Helix Screw Anchors

Working Load Categories				
Soil Type	35,600 N (8,000 lb.)	53,400 N (12,000 lb.)	71,000 N (16,000 lb.)	89,000 N (20,000 lb.)
A1	D-6632	D-6632	D-6636	D-6636
Soil	D-6636	D-6636	D-6637	D-6637
Class 2	D-6637	D-6637	D-6638	D-6638
A2	D-6632	D-6632	D-6636	D-6637
Soil	D-6636	D-6636	D-6637	D-6638
Class 3	D-6637	D-6637	D-6638	
B	D-6632	D-6636	D-6636	D-6638
Soil	D-6636	D-6637	D-6637	
Classes 4 & 5	D-6637		D-6638	
C	D-6636	D-6637	D-6638	
Soil Classes 6 & 7	D-6637			

- NOTES:
1. See REA Specification T-10 for definitions and explanations.
  2. Anchors in the 53,400 N (12,000 lb.) category or above for use on wood poles must be used with hardware commensurate with the working load. Hardware may provide for either single or multiple guy attachments to the anchor.
  3. Anchors listed in a specific working load category and/or soil class may generally be used at lower working load categories and/or lower numerical soil classes.

## Conditional List

Z  
July 1987

z - Anchors

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Chance</u>		
Screw anchors, power installed	1252 2/3/83	To obtain experience.
24462 (6,000 and 8,000 lb.)		
12332P 5/8" rod		
12587 5/8" thimbleye		
24484 (10,000 and 12,000 lb. anchor helix)		
12632P (3/4" rod)		
6512 (thimbleye nut)		
<u>Dixie</u>		
Screw anchors, power- installed	859 2/9/67	To obtain experience.
D-1162-G (6,000 & 8,000 lb., 5/8" rod)		
D-1375-G (10,000 & 12,000 lb., 3/4" rod)		
<u>Joslyn</u>		
Screw anchors, power- installed	973 8/19/71	To obtain experience.
J11B_CA (6,000 & 8,000 lb., 5/8" rod)		
J13C_CA (10,000 & 12,000 lb., 3/4" rod)		
<u>McGraw-Edison</u>		
Screw anchors, power- installed	992 5/25/72	To obtain experience.
DA11G621 (6,000 & 8,000 lb., 5/8" rod)		
<u>Foresight</u>		
Duckbill Service Anchor	1202	To obtain experience
#250 (2500 lbs., 5/8" rod)	12/18/80	
Duckbill Anchor		
#400 (6000 & 8000 lbs., 3/4" rod)		
#800 (10,000 & 12,000 lbs., 1" rod)		

NOTES: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

Catalog numbers shown are for anchors with 1-3/8" hubs. Equivalent anchors with 1-1/2" hubs are also acceptable. (A special installing wrench is required.)

aa, ab  
July 1987

aa - Nut, eye  
ab - Nut, thimble eye  
5/8 inch

Eye Nut  
Conventional



Eye Nut  
Eyelet



Thimble  
Eye Nut



	EN-5		
American Connector Engineering			
Barron Bethea	OEN-2A	B-14A	EN4A
Berny's Forging Co.	OE1	-	-
Bethea Electrical	E-5	B-5	NT-5
Champ	CH58EN	CH58BE	CH40TN
Chance	6502	-	6510
Continental Electric	EN-5	BE-5	TN-5
Dixie	D6502	DD-6517	D6510
Flagg (MIF)	P125C	P127A	P128A
Hughes	EN60	-	-
Joslyn	J1092	J1126	J6510
Kortick	K4212	K4413	K3111
McGraw-Edison	DG2E3	DG6E1	DG1E1
Power Line Hardware	OEN-58	BEL-58	-
Utilities Service	450	497	C580

ac  
July 1987

ac - Brace, sidearm diagonal

	1-1/2 inch angle <u>3/16" x 5'</u>	1-3/4 inch angle <u>3/16" x 7'</u>
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Chance	-	6984
Joslyn	J1521	J1525
Kortick	K1951	K1954
McGraw-Edison	DB1A1	DB1A5
Utilities Service	5210	5212



ae-1  
July 1987

ae - Surge Arrester, Distribution  
(Lightning Arresters)

<u>Manufacturer</u>	<u>Type</u>	<u>Ratings, kV</u>	<u>Duty</u>
General Electric	Alugard	9, 10, 18	Heavy
Joslyn	Q	9/10, 18	Normal
	J	9/10, 18	Heavy
Kearney	Unigap	9, 10, 18	Heavy
McGraw-Edison	TS	9/10, 18	Normal
	TL	9, 10, 18	Heavy
Westinghouse	LV	9/10	Normal
	LVBB	9/10, 18	Heavy

NOTE: Either arresters with external top gaps and without ground lead disconnectors or direct connected arresters with ground lead disconnectors may be used as specified by the user.

ae-2  
July 1987

ae - Surge Arresters, Substation\*  
(Lightning Arresters)

<u>Manufacturer</u>	<u>Type</u>	<u>Accepted Ratings - KV</u>	<u>Manufacturer's Classification</u>
General Electric	Alugard	3, 9, 10, 18	Distribution
Joslyn	Q	3, 9/10, 18	Distribution
Kearney	Unigap	3, 9, 10, 18	Distribution
Mc-Graw Edison	ES	3, 9/10, 18	Distribution
Westinghouse	LV	3-20	Distribution
	IVL	3-120	Intermediate
	CPL	3-312	Station

\* For instructions concerning application at substations, refer to REA Bulletin 65-1, "Guide for the Design of Substations for Electric Borrowers." In the purchase of arresters, care should be taken to select the type and voltage ratings in accordance with the line voltage and the type of construction (grounded or ungrounded).

Conditional List  
ae(1)  
July 1987

ae - Surge Arresters, Distribution  
Metal Oxide

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Joslyn</u> Surge arresters, distribution metal oxide type, ZQ 9, 10, 18 KV	1317 3/27/86	To obtain experience
<u>McGraw-Edison</u> Surge arresters, distribution, metal oxide type, AZL 9, 10, 18 KV	1287 9/27/84	To obtain experience
<u>Ohio Brass</u> Surge arresters, distribution metal oxide type Dynavar, DV 9, 10, 18 KV PDV 9, 10, 18 KV	1283 7/12/84 1334 1/15/87	To obtain experience
<u>Westinghouse</u> Surge arresters, distribution metal oxide type HMX HEAVY DUTY: 9, 10, 18 KV	1320 5/8/86	To obtain experience

NOTE: Either arresters with external top gaps and without ground lead  
disconnectors or direct connected arresters with ground lead  
disconnectors may be used as specified by the user.

Conditional List  
ae(2)  
July 1987

ae - Surge Arrester, Substation\*

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>General Electric</u>		
Surge arrester, station class, metal oxide type, Tranquell, 2.7 kV thru 588 kV	1164 5/24/79	To obtain experience
Surge arrester, intermediate class, metal oxide type, Tranquell, 3 kV thru 120 kV	1197 10/9/80	To obtain experience
<u>Joslyn</u>		
Surge Arrester, intermediate class, metal oxide type, Type ZI 3 thru 144 kV	1268 10/27/83	To obtain experience
Surge arrester, station class, metal oxide type, Type ZS, 3 kV thru 240 kV	1278 4/12/84	To obtain experience
Surge arrester, station Class, metal oxide type, Type ZSH, 258 thru 468 kV	1341 5/14/87	To obtain experience
<u>McGraw-Edison</u>		
Surge arrester, station class, metal oxide type, VariSTAR 3 kV thru 312 kV Type ATZ1A	1223 11/19/81	To obtain experience
Surge arrester.inter- mediate class,metal oxide type,VARISTAR 9 kV thru 120 kV, Type AZF	1287 9/27/84	To obtain experience
<u>Ohio Brass</u>		
Surge arrester, station class, metal oxide type Dynavar, 3 kV thru 357 kV	1175 11/2/79 1239 7/29/82	To obtain experience
Surge arrester, intermediate class, metal oxide type, Dynavar, 3 kV thru 120 kV	1242 9/9/82	To obtain experience
<u>Westinghouse</u>		
Surge arrester, station class, metal oxide type, SMX-30, 3 thru 240 kV	1256 4/6/83	To obtain experience

\*For instructions concerning application at substations refer to REA Bulletin 65-1, "Guide for the Design of Substations for Electric Borrowers." In the purchase of arresters, care should be taken to select the type and voltage rating in accordance with the line voltage and the type of construction (grounded or ungrounded).

af - Cutouts, Distribution, Open

<u>Manufacturer</u>	<u>Type</u>	<u>Voltage Rating</u>
Chance	C	15, 27 kV
General Electric	9F34D	15, 27 kV
Joslyn	L, 100 amp J, 200 amp	15, 27 kV
Kearney	MX (with or without loadbreak accessory)	15, 27 kV
McGraw-Edison	S1	15, 27 kV
S & C Electric	XS	15, 27 kV
Southern States	Series 66 Series 70	15, 27 kV 15 kV
Westinghouse	NCX LBU-11	15, 27 kV 15, 27 kV

NOTE: The buyer should specify the load rating, voltage rating, interrupting rating and required accessories.

Cutout used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

af-2  
July 1987

af - Cutout, open-link fuse support

<u>Manufacturer</u>	<u>Mounting</u>	<u>12.5/7.2 kV 50 amp.</u>	<u>24.9/14.4 kV 50 amp.</u>
Joslyn	Crossarm	J9254-6	J9264-6
Kearney	Crossarm	6484-55	-
	Bushing	6483-59	-
McGraw-Edison	Crossarm	FT1A2	FT1A4
	Bushing	FT10A3	-
RTE	Crossarm	41S3	41S6

NOTE: Items listed on this page are fuse supports only and have no inherent interrupting capacity. They should be used with fuse links capable of interrupting at least 1200 amperes and for transformer protection only.

af - Power Fuses, Substation

<u>Manufacturer</u>	<u>Type</u>	<u>Voltage Rating</u>
Kearney	HX	15
	HX	27
S & C Electric	XS	15-25
	SMD (Boric Acid)	15-138
Southern States	Series P	15-161
Westinghouse	RDB (Boric acid, refillable)	15-34.5
	DBS (Boric acid, non-refillable)	15-34.5
	DBA (Boric acid, refillable)	46-69

NOTE: All fuses listed on this page should be furnished with NEMA standard insulators. The buyer should specify the current rating, voltage rating, interrupting rating and required accessories.

Conditional List  
af  
July 1987

af - Cutouts, Distribution, Open  
with Linkbreak Attachment

<u>Manufacturer</u>	<u>Type</u>	<u>Voltage Rating</u>	<u>Meeting No. and date</u>	<u>Conditions</u>
A.B. Chance	C	15, 27 kV	1311 (12/19/85)	<ol style="list-style-type: none"><li>1. To obtain experience.</li><li>2. Limited to 100 amp cutouts.</li><li>3. To be used only with Chance, McGraw Edison and Kearney fuses. Will not break S&amp;C and some other fuse types.</li></ol>

Conditional List  
ag  
July 1987

ag - Fuses, Current Limiting, Backup

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Chance</u>		
15 kV Class		
Type K-Mate 25 Catalog No. C70L-31KA	1084 2/19/76	1. To obtain experience
25 kV Class		
Type K-Mate 25 Catalog No. C70L-32KA	1196 9/18/80	2. Must be used in series with external expulsion fuse 25 K or 15 T or smaller or with CSP transformers 50 kVA or smaller.
<u>High-Tech Fuses</u>	1290 11/29/84	
15 kV Class		Same as above
No. HTDE23 (X)025		
25 kV Class		
No. HTDE24 (X)025		
<u>McGraw-Edison</u>		
15 kV Class		
No. FAH6H45	1094	Same as above
25 kV Class		
No. FAH7H45	7/29/76	
<u>RTE</u>		
15 kV Class		
Catalog No. 3553025M11	1140	Same as above
25 kV Class		
Catalog No. 3554025M11	6/1/78	
<u>Westinghouse</u>		
15 kV Class		
Type CLTX, 25K/15T	1105	Same as above
25 kV Class		
Type CLTX, 25K/15T	1/6/77	

ah  
July 1987

ah - Tie, insulator, formed type

<u>Manufacturer</u>	<u>Type</u>
Preformed Line Products	WT "Wraplock" (Order for specific conductor size and insulator)
	ST "Groove-Formed" side tie (Order for specific conductor size and insulator)

Conditional List  
ah  
July 1987

ah - Tie, insulator, formed type

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Chance</u>		
Tygard Type AWTY-56* (Side tie for use over armor rod on spool insulator with 1-3/4" groove)	863 4/13/67	To obtain experience.
Super Top-Tie, Type STT for single or double support use, with insulators 2-1/4" through 3-1/2" neck diameter and single support use on spool insulators with 1-3/4" groove diameter (Order for specific conductor size.)	1132 2/2/78  1138 5/4/78	To obtain experience.
<u>Preformed Line Products</u>		
Spool Tie for ACSR, Type SPL* (Side tie for use on spool insulator with 1-3/4" groove)	877 9/14/67	To obtain experience.
DST double support top tie (Order for specific conductor size and insulator)	978 10/28/71	To obtain experience.
DBST double side tie (Order for specific conductor size and insulator)	1057 1/23/75	To obtain experience.

\*Not for side mounting on pin or post insulators.

ai-1  
July 1987

ai - Rods, Ground

Applicable Size: The standard length is 8 feet and catalog numbers listed below are for this length. Longer rods may be required for special conditions.

Copper-covered ground rods are listed with a 13 mil minimum at any point and a 15 mil average covering of copper. All purchases should specify that a factory certification of the thickness of the copper must accompany the shipment of the rods.

Copper-covered steel rods

5/8"

Boggs	EB810
Calpico	CP588
Carolina Galvanizing	P-588
Erico	E858
Blackburn	6258
Joslyn	J8338
Kortick	K5428
Knight	858
Power Line Hardware	GR-588C
Utilities Service	6617
Weaver	W588
Wilcor	WA588C

Stainless Clad Steel

<u>Manufacturer</u>	<u>5/8"</u>	<u>3/4"</u>
Teledyne (MEFCO)	"PERMAGROUND"	"PERMAGROUND"

## ai - Rods, Ground

**Applicable Size:** The standard length is 8 feet and catalog numbers listed below are for this length. Longer rods may be required for special conditions.

Hot Dip Galvanized Steel

<u>Manufacturer</u>	<u>5/8"</u>	<u>3/4"</u>
Apache	G588**	G348* **
Blackburn	GR6258	GR7508
Boggs	G588	G348
Carolina Galvanizing	PTG588**	PTG348**
Chance	G588	G348
	G-588PT**	G-348PT**
Dixie	8578	8618
Erico	C203-0107**	C203-0109**
	C203-0377*	
Galvan	D8578	D8618
General Electric	G588	G348
Grip-Tite	G588PT**	G348PT**
Joslyn	GR6258	GR7508
Knight	0982-00002	0982-00003
Kortick	GT588	GT348
Lloyd	GT588PT**	GT348PT**
McGraw-Edison	J3358B*	J3458B*
National Utility Products	J5328	J5338
Porcelain Products	J5228**	J5238**
Power Line Hardware	G-588	G-348
Utilities Service	G-588PT**	G348PT**
Weaver	K4658	K4678
Wilcor	6258H	7508H
	DN5S8	DN6S8
	DN6D8*	
	UR1016-8	UR1216-8
	7338	7348
	GR-588G	GR-348G
	5307	6338
	8580G	8340G
	WA8580G	WA8340G

Electro-Galvanized Steel

Calpico	G8580	-
LMP	6258E**	7508E**

Stainless Steel

Teledyne (MEFCO)	TDY Sol	TDY Sol
Wilcor	WA 588-S	WA348-S

\*Rod furnished with clamp.

\*\*Rod furnished with 4 ft., No. 6 tinned or galvanized copper pigtail.

ai-3  
July 1987

ai - Rods, ground, sectional

Galvanized steel and  
copper-covered steel

Copper-covered ground rods are listed with a 13 mil minimum at any point and a 15 mil average covering of copper. All purchases should specify that a factory certification of the thickness of the copper must accompany the shipment of the rods.

Sectional Ground Rods

<u>Manufacturer</u>	<u>8' long</u>	<u>10' long</u>	<u>Coupling</u>	<u>Driving studs</u>
Blackburn	6258S	6260S	60C	60DS
Carolina Galv.	S-588 GSD-588 GSD-348	S-5810 GSD-5810 GSD-3410	CR58 CG250 CG250	DSH58 DSH58 DSH58
Chance Galv. Steel	C203-0052	8512	8611	-
Erico	ES858	ES1058	CR58	DSH58
Joslyn Galv. Steel	J9158 J23282.8	J9160 J23282.10	J9182 J23282A	J9186 J9186
Knight	S858 GSD858 GSD834	S1058 GSD1058 GSD1034	SC58 KG250 KG260	DS58 DS58 DS34
Kortick	K5441	K5443	K5482	K5492
McGraw-Edsion Galv. Steel	DN17S8	DN16S10	DN1K2	-
Power Line Hardware	GR-588CS	GR-5810CS	CBC-58	DS-58
UTM	-	-	910-030-05	-
Weaver	W-588T	W-5810T	158C	358D

aj  
July 1987

aj - Clamp, Ground Rod

<u>Manufacturer</u>	<u>For 5/8"</u> <u>Copper-Covered Rod</u>	<u>For 3/4" Galv. or Stainless Steel Rod</u>	<u>For 5/8" Galv. or Stainless Steel Rod</u>
AMP	Copper AMPACT (Order by Description)	-	-
Anderson	GC-5	-	-
Blackburn	G5	-	-
Boggs	G31	-	-
Burndy	GRC58	-	-
C & R Products	CRGC-58	-	-
Carolina Galv.	CPH58	-	CPH58
Dossert	GNL62H	-	-
*Erico (Cadweld)			
1 ground wire	GR1-161G	GR1-181G	GR1-161G
2 ground wires	GT1-161G	GT1-181G	GT1-161G
Greaves/Mercury	G-580	-	-
Iasco	GRC-58	-	-
Joslyn	J8392AB	J25985	J25932
Knight	C58	UCSS	UCSS
Kortick	K4647	-	-
O-Z Elec. Mfg.	BG0304	-	-
Penn-Union	CEB-2	-	-
Power Line Hardware	RC-58CE	-	-
Reliable	E58	3459	3459
UTM	910-023-03	910-007-02	910-007-02
Weaver	WB5/8	-	-
Wilcor	HGR5/8	WAU-3/4"	WAU-5/8"

\*Includes disposable molds.

Conditional List

aj

July 1987

aj - Clamp, ground rod

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Burndy YGHP (for 5/8" copper- covered rods)	1234 5/13/82	To obtain experience.
Power Line Hardware RC-34 (for 5/8" and 3/4") galvanized or stainless steel ground rods	1114 5/12/77	To obtain experience.

a1  
July 1987

a1 - Staples, ground wire

Applicable Specification: ANSI C135.14, "Standards for  
Staples with Rolled or Slash  
Points."

Length x Spread (inches)	1-1/2 x 1/4	2 x 1/2	1-1/2 x 3/8	3 x 1-1/16
Diameter	9 gauge <u>Galv. Steel</u>	8 gauge <u>Galv. Steel</u>	8 gauge <u>Copper-Coated</u>	1/4 <u>Moulding</u>
Blackburn	-	-	CUS9	CUS22
Chance	C205-0247	C205-0216	9167	9161
Copperweld	-	-	CP52	-
Joslyn	J1672G	J157	J6652	J6497
Kortick	-	-	K247	K236
Larson	-	350453	750233	721312
Utilities Service 88		86	48	46

Barbed staples, ground wire

Length x Spread (inches)	1-1/2 x 3/8	2 x 5/8	1-1/2 x 3/8	3 x 1-1/16
Diameter	.131 <u>Galv. Steel</u>	.165 <u>Galv. Steel</u>	.140 <u>Copper-Coated</u>	7/32 <u>Galv. Steel</u>
Joslyn	J7656	J7672	J7682	J7664

Length x Spread (inches)	2 x 1/2 <u>8 gauge</u>	1-1/2 x 3/8 <u>8 gauge</u>	3 x 1-1/16 <u>1/4 moulding</u>
Joslyn	-	J6652AL	J-7493AL

Clip, ground wire

Kearney 12326

Conditional List  
al  
July 1987

al - Staples, Ground Wire

Clip, Ground Wire

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Fastex (ITW) No. 780-2	1038 4/4/74	To obtain experience.

an-1.1  
July 1987

. an - Transformers, distribution, pole type  
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

Applicable Specifications: REA Specifications for Rural Distribution  
Transformers, D-10

Listing is by type rather than by catalog number because of the many  
possible combinations of voltage, kVA and taps and protective equipment.

	<u>7.2/12.5 &amp;</u> <u>7.62/13.2</u>	<u>14.4/24.9</u>	<u>Dual Voltage</u>
<u>Arkansas Electric Cooperative</u>			
Conventional, single bushing	ASE		
<u>Central Moloney</u>			
Conventional, single bushing	AOD	AOD	AOD
Conventional, two bushing	AOD	AOD	AOD
Self-protected, single bushing	DVP	DVP	DVP
The single bushing transformer may also be obtained with bushing mounted cutout and lightning arrester, and with internal fuse and double gap.			
<u>Dowzer</u>			
Conventional, single bushing	CR	CR	CR
Self-protected, single bushing	CSP-R	CSP-R	CSP-R
Conventional, two bushing	CD	CD	CD
<u>ERMCO</u>			
Conventional, single bushing	CONV	CONV	CONV
Conventional, two bushing	CONV	CONV	CONV
Self-protected, single bushing	CSP	CSP	CSP

The single bushing transformer may  
also be obtained with double gap and  
internal fuse (Type DG) or lightning  
arrester and external cutout (Type COLA).

Dead-front for use in enclosure: Add "R" (Radial) or "LF" (Loop feed)  
to designation.

an-1.2  
July 1987

an - Transformers, distribution, pole type  
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	<u>7.2/12.5 &amp;</u> <u>7.62/13.2</u>	<u>14.4/24.9</u>	<u>Dual Voltage</u>
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General Electric

Conventional, single bushing	HS	HS	HS
Self-protected, single bushing	HSBA	HSBA	HSBA
Conventional, two bushing	HS	HS	HS

Type HS may also be obtained with internal fuse, with internal fuse and double gap, with bushing mounted cutout and double gap, and with bushing mounted cutout arrester (Type HSCA).

Howard Industries

Conventional, single bushing	REC-C	REC-C	REC-C
Conventional, two bushing	Conv-2B	Conv-2B	Conv-2B
Self-protected, single bushing	REC-P	REC-P	REC-P

Kuhlman

Conventional, single bushing	I	I	I
Conventional, two bushing	B	B	B
Self-protected, single bushing	H	H	H

Type I may also be purchased with internal fuse, with internal fuse and double gap (Type G), and with bushing mounted cutout and lightning arrester (Type J).

Magnetic Electric

Conventional, single bushing	AOD	AOD	AOD
Conventional, two bushing	AOD	AOD	AOD
Self-protected, single bushing	AOD	AOD	AOD

McGraw-Edison

Conventional, single bushing	G	G	GD
Self-protected, single bushing (with open-gap valve arrester)	L	L	LD
Conventional, two bushing	E	E	ED

Type G may also be obtained with internal fuse, with internal fuse and double gap, and with bushing mounted cutout and lightning arrester.

an - Transformers, distribution, pole type  
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	<u>7.2/12.5 &amp;</u>	<u>14.4/24.9</u>	<u>Dual Voltage</u>
	<u>7.62/13.2</u>		

NECO/Hammond

Conventional, single bushing	NC	NCH
Self-protected, single bushing	NC-1	NCHCB

Type NC may also be obtained with double gap and internal fuse (NC-2) and with arrester and open link fuse (NC-3).

H. K. Porter (Delta-Star)

Conventional, single bushing	OS-B3	OS-B3	OS-B3
Self-protected, single bushing	OSP-B3	OSP-B3	OSP-B3
Conventional, two bushing	OS-A	OS-A	OS-A

Types OS-B3 and OS-A may also be obtained with internal fuse.

RTE

Conventional, single bushing	REA-Conv	REA-Conv	REA-Conv
Self-protected, single bushing	REA-CSP	REA-CSP	REA-CSP
Conventional, two bushing	REA-Conv	REA-Conv	REA-Conv

Conventional single bushing type may also be purchased with external overload protection and double gap and with bushing mounted cutout and lightning arrester.

Rural Electric Supply Cooperative

Conventional, single bushing	CONV
Conventional, two bushing	CONV
Self-protected, single bushing	CSP

The single bushing transformer may also be obtained with double gap and internal fuse (Type DG) or lightning arrester and external cutout (Type COLA).

Dead-front for use in enclosure:  
Add "R" (Radial) or "LF" (Loop Feed) to designation.

an-1.4  
July 1987

an - Transformers, distribution, pole type  
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	<u>7.2/12.5 &amp;</u> <u>7.62/13.2</u>	<u>14.4/24.9</u>	<u>Dual Voltage</u>
<u>United (Ky. AEC)</u>			
Conventional, single bushing	SC	SC	DSC
Conventional, two bushing	SC	SC	DSC
Self-protected, single bushing	SCP	SCP	DSCP

SC and DSC may be purchased with  
external fuse and arrester (SP and DSP)

VanTran

Conventional, single bushing	CR
Self-protected, single bushing	CSP-R
Conventional, two bushing	CD

Westinghouse

Conventional, single bushing	S-B3	S-B3	S-B3
Self-protected, single bushing	CSP-B3	CSP-B3	CSP-B3
Conventional, two bushing	S-A	S-A	S-A

Type S-B3 may also be obtained  
with internal fuse, with internal  
fuse and double gap, and with  
lightning arrester and open link  
cutout (Type PC).

Sesco

Conventional, single bushing	RU
Self-protected, single bushing	ESP
Conventional, two bushing	CONV

Type RU may also be purchased  
with internal fuse and/or  
lightning arrester.

an-2.1  
July 1987

**an - Transformers. Power Single-Phase, Step-Down for Distribution Substation Use**

**Applicable Specification:** REA Specification for Step-Down Substation Transformers. S-3

Transformers with 115 kV and 138 kV primary voltage ratings are acceptable with full BIL and with one step reduced BIL.

"X" indicates that acceptable test data have been furnished REA for this rating and for secondary voltages in either 15 kV or 25 kV class.

All acceptances are based on standard impedances, taps, winding designs, materials and accessories. Variations should not be ordered except under special circumstances. Complete design tests should be specified for special designs.

## **an - Transformers. Power Single-Phase, Step-Down for Distribution Substation Use**

**an - Transformers, Power  
Three-Phase, Step-Down  
For Distribution Substation Use**

Transformers 5 MVA and larger also accepted as load tap changing transformers using federal Pacific type IC-525 load tap changers.

Transformers 5 MVA and larger also accepted as load tap changing transformers using General Electric types 1872, 1895 and 1897-200 load tap changers

Kuhlmann	34.4
	43.8
	67.0
	115
	138

Transformers 5 MVA and larger also accepted as load tap changing transformers using Siemens-Allis Types T1S and T1H-21 load tap changers.

**an - Transformers, Power  
Three-Phase, Step-Down  
For Distribution Substation Use**

Primary Voltage-kV	MVA					MVA								
	250	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
<b>McGraw-Edison</b>														
34.4	x			x	x	x	x	x	x	x	x	x	x	x
43.8	x	x	x	x	x	x	x	x	x	x	x	x	x	x
67.0		x		x	x	x		x	x	x	x	x	x	x
115			x		x	x	x	x	x	x	x	x	x	x
138				x	x	x	x	x	x	x	x	x	x	x

Transformers 5 MVA and larger also accepted as load tap changing transformers using McGraw-Edison Types 550, 550B, and 550C load tap changers.

**ASEA Electric**

34.4	x			x	x	x	x	x	x	x	x	x	x	x
43.8		x		x	x	x	x	x	x	x	x	x	x	x
67.0			x	x	x	x	x	x	x	x	x	x	x	x
115				x	x	x	x	x	x	x	x	x	x	x
138					x	x	x	x	x	x	x	x	x	x

Transformers 5 MVA also accepted as load tap changing transformers using ASEA Electric Type UZD load tap changers.

**Westinghouse**

34.4	x			x	x	x	x	x	x	x	x	x	x	x
43.8		x		x	x	x	x	x	x	x	x	x	x	x
67.0		x	x	x	x	x	x	x	x	x	x	x	x	x
115			x	x	x	x	x	x	x	x	x	x	x	x
138				x	x	x	x	x	x	x	x	x	x	x

Transformers 5 MVA and larger also accepted as load tap changing transformers using Westinghouse Types UT5-A, UT7-B and UW load tap changers.

Conditional List  
an(1.1)  
July 1987

an - Transformers, Distribution, Pole Type

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>General Electric</u> 7.2/12.5, 7.62/13.2, 14.4/24.9 kV and Dual Voltage		
Single-phase, single bushing, and two bushing with internal Tranquell Under-oil Arrester	1316 3/6/86	To obtain experience.
Single-phase, single bushing and two bushing, 25 and 50 kVA pole type distribution transformers with amorphous metal cores	1320 5/8/86	To obtain experience.
<u>Tarrant</u> 7.2/12.5 kV and 7.62/13.2 kV	791 4/30/64	To obtain experience.
Conventional, single bushing Type CB-1		
Conventional, two bushing Type CB-2		
Self-protected, single bushing Type SG-1		
May also be obtained with lightning arrester and internal fuse. Types PSG-1 and PSG-2.		

Conditional List  
an(1.2)  
July 1987

an - Transformers, Distribution, Pole Type

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>VanTran</u> 14.4/24.9 kV and Dual Voltage	1075 10/16/75	To obtain experience.
Conventional, single bushing Type CR		
Conventional, two bushing Type CD	1095 8/11/76	
Self-protected, single bushing Type CSP-R		
<u>Westinghouse</u> 7.2/12.5, 7.62/13.2	1333 12/18/86	To obtain experience.
Single-phase, single bushing, 25 kVA pole type distribution transformers with amorphous metal cores.		

## **an - Transformers, Power Single-Phase, Step-Down For Distribution Substation Use**

**Condition of Acceptance:** To obtain experience.

Transformers with 115 kV and 138 kV primary voltage ratings are acceptable with full BIL and with one step reduced BIL.

"X" indicates that acceptable test data have been furnished REA for this rating and for secondary voltages in either 15 kV or 25 kV class.

"s" indicates that performance specifications have been furnished REA and test data are to be submitted when available.

Conditional List  
an-(2.2)  
July 1987

## **en - Transformers. Power Single-Phase. Step-Down for Distribution Substation Use**

**Condition of Acceptance:** To obtain experience.

an - Transformers, Power  
Three-Phase, Step-Down  
for Distribution Substation Use

Condition of Acceptance: To obtain experience.

Primary Voltage-kV	750	1000	1500	2000	2500	3750	MVA	5	7.5	10	12	15	20	25	30
<u>ASEA Electric</u>															
115															
138															

Transformers 5 MVA and larger also accepted as load tap changing transformers using ASEA Electric Type U2D load tap changers.

Central Moloney

34.4															
67.0															

Transformers 5 MVA and larger also accepted as load tap changing transformers using Federal Pacific Type TC-525 load tap changers.

<u>Ferranti-Packard</u>	s	s	s	s	x	x	s	s							
34.4															
43.8															
115															
138															

Transformers 5 MVA and larger also accepted as load tap changing transformers using General Electric Types LR72, LR65 and LRT-200 load tap changers.

<u>General Electric</u>															
34.4															
43.8															
115															
138															

Transformers 5 MVA and larger also accepted as load tap changing transformers using Westinghouse Types UTS-A and UTS-B and Siemens Allis Type TS load tap changers.

<u>Hevi-Duty</u>		x	x	s	x	x	x	x	x	x	x	x	x	s	s
34.4		s	s	x	x	x	x	x	x	x	x	x	x	x	s
43.8															s
67.0															s
115															s
138															x

Transformers 5 MVA and larger also accepted as load tap changing transformers using Westinghouse Types UTS-A and UTS-B and Siemens Allis Type TS load tap changers.

## **an - Transformers. Power Three-Phase, Step-Down for Distribution Substation Use**

**Condition of Acceptance:** To obtain experience.

Primary	KVA	H. K. Porter (Delta Star)	H. K. Porter (Y Star)	McGraw-Edison	McGraw	RIE	Westinghouse
	34.4	s	s	s	s	s	s
	43.8	s	x	s	x	x	s
	67.0	s	s	x	x	x	s
	115	s	s	x	x	x	s
	138	s	s	x	x	x	s
Transformers 5 MVA and larger also accepted as load tap changing transformers using Siemens-Allis Types TIS and TH-21 load tap changers.							
Voltage-KV	250	1000	1500	2000	2500	3250	5
	34.4	s	s	s	s	s	s
	43.8	s	s	s	s	s	s
	67.0	s	s	s	s	s	s
Transformers 5 MVA and larger also accepted as load tap changing transformers using McGraw-Edition Types 550, 550B and 550C load tap changers.							
H. K. Porter (Delta Star)	34.4	s	s	s	s	s	s
	43.8	s	x	x	s	x	s
	67.0	s	s	s	x	x	s
Transformers 5 MVA and larger also accepted as load tap changing transformers using Westinghouse Types UTSA and UTI-B load tap changers.							
Westinghouse	34.4	s	s	x	x	x	s
	43.8	s	s	s	x	x	s
	67.0	s	s	s	x	x	s
	115	s	s	s	s	s	s
	138	s	s	s	s	s	s
Transformers 5 MVA and larger also accepted as load tap changing transformers using RIE load tap changers.							
RIE	34.4	s	s	x	x	x	s
	43.8	s	s	s	x	x	s
	67.0	s	s	s	x	x	s

Conditional List  
an(4)  
July 1987

an - Transformers, 2:1 Ratio, Single Phase,  
Autotransformers or Two-Winding Transformers  
for Use in System Voltage Conversion

Condition of Acceptance: To obtain experience.

<u>Manufacturer</u>	<u>Designation</u>	<u>Size</u>
<u>Central Moloney</u> 2-WND	AOD	167-500
<u>General Electric</u> 2-WND AUTO	MS STEP MS STEP	167-500 167-1000
<u>Howard Industries</u> 2-WND	STEPS	167-500
<u>McGraw-Edison</u> 2-WND AUTO	"Round-Coil" MEPS-AUTO	167-500 167-1000
<u>H. K. Porter (Delta Star)</u> 2-WND AUTO	LTD LTD-A	167-500 167-1000
<u>Westinghouse</u> 2-WND	"Jumbo"	167-500

NOTE: Two-winding transformers are self-protected under external short circuit in accordance with ANSI C57.12.90A. Auto-transformers will withstand 25 times rated current under external short circuit in accordance with ANSI C57.12.90A.

ao  
July 1987

ao - Bolt, strand eye, straight (thimble eye)

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes : 5/8 inch, 6 through 12 inch length  
3/4 inch, 8 through 12 inch length

The following manufacturers have shown compliance with the applicable specification:

A. B. Chance Company  
Dixie Electrical Manufacturing Company  
Joslyn Mfg. and Supply Company  
Kortick Manufacturing Company  
\*McGraw-Edison  
Utilities Service Company



"Static proof" designs available.

ap-1  
July 1987

ap - Clamp, hot line  
Copper and Copperweld-copper Conductor  
(Clamps with internal springs and enclosed threads)

Conductor Size

	6 thru	2/0
Copper		
Copperweld-copper	<u>8A thru</u>	<u>2A</u>

Anderson	BH-00
Blackburn	HLC 2108
Chance	S1520CC
Electrical Specialty	BC-2/0
Fargo	GH-100*
Ideal	3532
Penn-Union	HLC-020-LS

\* For use with CL Fuse, order GH-201

ap-2  
July 1987

ap - Clamp, hot line  
ACSR with armor rods

Clamps listed below have spring action and enclosed thread chambers.

Conductor Size		4/0 & 3/0	2/0	1/0 & 2	4
	<u>Tap Conductor</u>				
Anderson	Aluminum Copper	AH-7 AH-7-GP	AH-4 AH-4-GP	AH-4 AH-4-GP	AH-4 AH-4-GP
Chance	Aluminum Copper	S1540-AA S1540-AC	S1540-AA S1540-AC	S1530-AA S1530-AC	S1530-AA S1530-AC
Electrical Specialty	Aluminum Copper	-	AHC-2/0 AHC-2/0 GP	AHC-2/0 AHC-2/0 GP	AHC-2/0 AHC-2/0 GP
Fargo	Aluminum Copper	GH-102A GH-102AC	GH-102A GH-102AC	GH-101A GH-101AC	GH-101A GH-101AC
Penn Union	Aluminum Copper	-	-	HLCA-040 HLCA-040	HLCA-040 HLCA-040
Utilco	Aluminum	-	HLC-397	-	HLC-40

ar  
July 1987

ar - Wireholder

Applicable Specification: "REA Specification for Service Wireholders," D-15

	<u>With #22 Wood Screw</u>	<u>With 3/8" x 5" Bolt</u>
Blackburn	SW3	-
Chance	3-11-44	-
Dixie	D3-11-44	-
Joslyn	J089	-
McGraw-Edison	DW1R1	-
Porcelain Products	1986	-
Universal Clay Products	415	-



NOTE: For Triplex type service cable see clevis type wireholders on page "bt."

as  
July 1987

as - Clevis, service swinging

Applicable Specifications: "REA Specifications for Service Swinging Clevises," D-7

	<u>Clevis Only*</u>	<u>Clevis with Wet Process Spool</u>	<u>Clevis with Dry Process Spool</u>
Chance	1948C	1948C-C909-1031	1948C-0606
Dixie	D1938	D1938-C	D1948-C
Joslyn	J1614	-	J1615
Kortick	K9260	K9141	K9142
McGraw-Edison	DC7S2	-	-
Utilities Service	32003	31003	31004

\*Catalog number does not include spool; for spool insulators see Item cm.

at-1  
July 1987

at - Guy Marker, 8 Foot Length

Steel

<u>Manufacturer</u>	<u>Full Round</u>	<u>Half Round</u>
Joslyn	J1618	J1528
Kortick	K3729	-
McGraw-Edison	DG15G1	DG5G3

at-2  
July 1987

at - Guy Marker  
8 Foot Length  
Plastic or Fiberglass

<u>Manufacturer</u>	<u>Catalog Number</u>
Auburn Extrusions	TK-808 (Yellow) (with bolt type clamp)
Chance	96-PBG-2 (Gray) 96-PBG-2Y (Yellow) 96-PBG-2ORG (Orange)
Chance*	96-FRPMR-GRY (Gray) 96-FRPMR-YEL (Yellow) 96-FRPMR-ORG (Orange) 96-FRPMR-GRN (Green)
Electrical Materials*	70-7 (Gray) 70-7 (Yellow) 70-7 (Green) 70-7 (Orange)
Joslyn	J1491Y (Yellow) J1491G (Gray)
Joslyn*	J26260.8 (Yellow) J26261.8 (Gray)
Nordic	HRG-8 (Orange)
Preformed Line Products*	PG-5508 (Gray) PG-5518 (Yellow)
Radar Engineers*	6032 (Yellow)
Tranpol*	HGG-OL8Y-C (Yellow)
Virginia Plastics*	TG-125-8G (Gray) TG-125-8Y (Yellow)
Virginia Plastics**	FG-8G (Gray) FG-8Y (Yellow)

\* For use with formed or automatic type deadends for guy strand; will not fit over bolt type guy clamps.

\*\* Available with either 1 or 2 bolt clamps.

Conditional List  
at  
July 1987

at - Reflective Guy Marker, 8-foot length

Plastic or Fiberglass

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
*Nordic HG-815 yellow	1061 3/20/75	To obtain experience.

\*For use with formed or automatic type deadends for guy strand; will not fit over bolt type guy clamps.

av-1  
July 1987

av - Conductor, ACSR

Applicable Specification: ASTM Specification B 232

Preferred Sizes: (Larger sizes may be used where the engineer's study shows they are required.)	Distribution	Transmission
	4 - 6/1	1/0 - 6/1
	4 - 7/1	2/0 - 6/1
	2 - 6/1	3/0 - 6/1
	2 - 7/1	4/0 - 6/1
	1/0 - 6/1	266.8 kcmil - 26/7
	2/0 - 6/1	336.4 kcmil - 26/7
	3/0 - 6/1	477 kcmil - 26/7
	4/0 - 6/1	556.5 kcmil - 26/7
	266.8 kcmil 18/1	795 kcmil - 26/7
	336.4 kcmil 18/1	954 kcmil - 54/7
	477 kcmil 18/1	

The following manufacturers have shown compliance with the applicable specifications:

Alcan Cable

Aluminum Company of America

Cablec

Kaiser

Nehring

Noranda

Pirelli Cable

Reynolds

Southwire

NOTES

1. Conductors with 18/1 stranding have different sag characteristics than conductors with 6/1 or 26/7 stranding. This difference in sag characteristics must be taken into consideration in the line design.
2. 266.8 kcmil 26/7, 336.4 kcmil 26/7, and 477 kcmil 26/7 may be used for distribution underbuild on transmission lines.

av-2  
July 1987

av - Conductor, copper

Applicable Specifications: ASTM Specification B1-81 (or latest revision) for hard-drawn solid  
ASTM Specification B8-81 (or latest revision) for hard drawn stranded and soft stranded  
ASTM specification B3-74(80) (or latest revision) for soft or annealed solid.

Preferred Sizes:

Hard-drawn solid	4 and 6
Soft or annealed solid	4 and 6
Hard-drawn stranded	2x3, 1/0 x 7, 2/0 x 7
Soft stranded	4 and 6

The following manufacturers have shown compliance with the applicable specifications:

Alcan Cable

Allied Tube & Conduit

Cablec

Essex

General Cable

Hatfield (Sizes 4 and 6)

Phelps Dodge

Rome Cable

Service Wire Company

Southwire

av-3  
July 1987

av - Conductor, Copperweld-copper

Applicable Specification: ASTM Specification B 229

Preferred Sizes:	<u>Distribution</u>	<u>Transmission</u>
8A		1/0 F
6A		2/0 F
4A		3/0 F
2A		4/0 F

The following manufacturers have shown compliance with the applicable specification for the sizes indicated:

Copperweld Steel (All sizes)

Southwire (2A and smaller)

av-4  
July 1987

av - Conductor, Service  
(Single Conductor)

<u>Manufacturer</u>	<u>Aluminum</u>	<u>Copper</u>
Alcan Cable	x	x
Conductor Products	x	
Essex	x	x
Kaiser	x	
Phelps Dodge	x	
Pirelli Cable	x	x
Reynolds	x	
Rome Cable	x	x
Southwire	x	x
Cablec	x	x

Applicable Specification: IPCEA-NEMA Standard S-66-524

Insulation: Cross-linked thermosetting polyethylene or equal, meeting requirements of Sections 7.3.3 and 7.3.5.

Conductor: Physically and electrically equal to MHD copper or HD (EC-H19) aluminum, meeting requirements of Section 7.3.2. (Compact or compressed stranded conductor is acceptable.)

Marking: Manufacturer's name and type of insulation shall be clearly shown in durable markings on the surface of the insulation at intervals no greater than 24 inches.

av-5  
July 1987

av - Conductor, Service Cable  
(Triplex and Quadruplex)

<u>Manufacturer</u>	<u>Aluminum</u>	<u>Copper</u>
Alcan Cable	x	x
Allied Tube & Conduct	x	x
Cablec	x	x
Conductor Products	x	
Essex	x	x
Hendrix	x	x
Kaiser	x	
Phillips Cables, Inc. (Marked "Phillips H")	x	
Pirelli Cable	x	x
Reynolds	x	
Rome Cable	x	x
Southwire	x	x

Applicable Specifications: REA Specification D-2, Specifications for  
600 Volt Neutral-Supported Secondary Service  
Drop Cables.

av-6  
July 1987

av - Conductor, Aluminum Alloy

Applicable Specification: ASTM Specification B399

Preferred Sizes:

<u>DISTRIBUTION</u>	<u>ACSR Equiv.</u>	<u>TRANSMISSION</u>	<u>ACSR Equiv.</u>
<u>6201</u>	<u>6201</u>		
48,690 cmil - 7 str.*	4	123,300 cmil - 7 str.**	1/0
77,470 cmil - 7 str.*	2	155,400 cmil - 7 str.**	2/0
123,300 cmil - 7 str.	1/0	195,700 cmil - 7 str.**	3/0
155,400 cmil - 7 str.	2/0	246,900 cmil - 7 str.	4/0
195,700 cmil - 7 str.	3/0	312,800 cmil - 19 str.	266,800 cmil
246,900 cmil - 7 str.	4/0	394,500 cmil - 19 str.	336,400 cmil
		559,500 cmil - 19 str.	477,000 cmil
		652,400 cmil - 19 str.	556,500 cmil
		927,200 cmil - 37 str.	795,000 cmil

\*Not recommended for multiphase lines with span lengths exceeding 300 ft.

\*\*Not recommended for suspension type construction.

The following manufacturers have shown compliance with the applicable specifications:

<u>Manufacturer</u>	<u>Type</u>
Alcan	6201
Alcoa	6201
Kaiser	6201
Reynolds	6201
Southwire	6201

Conditional List

av

July 1987

av - conductor

Manufacturer

Meeting No.  
and Date

Conditions

Copperweld Steel

863 (4/13/67)

To obtain experience.

Alumoweld-aluminum  
6/1 ACSR/AW, #2, #1/0,  
#2/0, #4/0  
4/3 AWAC, #4, #2, #1/0

984 (2/3/72)

To obtain experience.

Reynolds Metals

5005 Aluminum Alloy #4-7  
strand through 4/0-7 strand;  
281,460 cm<sup>2</sup> 11-19 strand  
(266,800-18/1 ACSR equiv.)  
through 312,760 cm<sup>2</sup> 11-19 strand  
(266,800-26/7 ACSR equiv.)

803 (10/22/64)

Where suspension insulator type of construction is employed on transmission lines, the minimum size of this conductor to be used is 4/0.

Southwire

5005 Aluminum Alloy #4-7  
strand through 4/0-7 strand;  
557,500 cm<sup>2</sup> 11-19 strand  
(477,000-26/7 ACSR equiv.)

999 (8/31/72)

Where suspension insulator type of construction is employed on transmission lines, the minimum size of this conductor to be used is 4/0.

Alcoa

795 kcmil 26/7 ACSR/AW

1247 (11/18/82)

To obtain experience.

aw  
July 1987

aw - Washer, Spring

1/4 x 1-3/4" x 3-1/2"

<u>Manufacturer</u>	Bolt Size		
	5/8"	3/4"	7/8"
Chance	3540	3541	--
Joslyn	J3540	J3541	J3542
Kortick	K2909	--	--
Fastex (ITH) "Ramp Lok"	1-760-21	1-760-31	1-760-41
McGraw-Edison	DF17W3	DF17W4	DF17W5
Power Line Hardware	SCH-58	SCH-34	SCH-78

ax - Cutout and Arrester. Combination

Nominal System Voltage	for 12.5Y/7.2 kV		for 13.2Y/7.6 kV		for 24.9Y/14.4 kV	
	7.8 kV	15 kV	15 kV	30 Bank	30 Sect.	10 Trans.
Application			30 Sect.	10 Sect.	10 Sect.	10 Sect.
Cutout Current Rating	10 Trans. 50°	10 Sect. 100	10 Sect. 100	10 Sect.	10 Sect.	10 Sect.
Manufacturer	Mounting					
Chance	Crossarm Transformer	C71A-112P8 Series	C71A-112P8 Series	9F80	9F80	9F80
General Electric	Crossarm (L) Transformer	9F78A	9F78A			9F80
Joslyn (valve)	Crossarm (valve)	J9237-Q6	J9237-Q2/R	J9237-Q6	J9237-Q2/R	J9267-Q6
(valve)	Crossarm (valve)	J9237-Q2/B	J9237-Q2/B/R	J9238-1Q	J9238-1Q	J9267-Q2/B
Kearney	Crossarm Transformer	294072		K63AB110E-110	K64AB110E-110	K67BD109E-110
McGraw-Eldison	Crossarm (L) Transformer	AFS301B Series	AFS301C Series	AFS800M010	AFS301C Series	AFS800M018 Series

Either normal duty or heavy duty distribution class arresters listed on page ax-1 are acceptable for use with these combination units.

\*These cutouts have open links and must not be used where fault currents are high or for sectionalizing.

(L) Indicates loadbreak type is available.

ax-2  
July 1987

## **ax - Cutout and Arrester, Combination**

Nominal System Voltage	For 12.5/7.2 KV Hys	For 13.2/7.6 KV Hys	For 24.9/14.4 KV Hys			
Cutout Max. Voltage Rating	7.8 KV	15 KV	18 KV			
Application	For 10 Transformers & 10 Sectionalizing	For 30 Banks For 10 Sect.	For 30 Banks For 10 Trans. For 30 Banks For 10 Sect. & 10 Sect.			
Cutout Current Rating	50°	100	50°	100	50°	100
Manufacturer Type Mounting	Catalog Numbers					
Westinghouse Crossarm Electric	7.8 MCX/ 9 LVG	15 MCX/10 LVG	15 MCX/10 LVG	15 MCX/10 LVG	15 MCX/10 LVG	15 MCX/10 LVG
Corporation Crossarm (LBU-III)	7.8 LBU-III/ 15 LBU-III/10	15 LBU-III/10	15 LBU-III/10	15 LBU-III/10	15 LBU-III/10	15 LBU-III/10

Either normal duty or heavy duty distribution class arresters listed on page 2-1 are acceptable for use with these combination units.

These cutouts have open links and must not be used where fault currents are high or for sectionalizing.

(L) Indicates loadbreak type is available.

ay  
July 1987

ay - Cutout and gap, combination

<u>Manufacturer</u>	<u>Type of Mounting</u>	<u>12.5/7.2 kV</u> <u>50 amp*</u>	<u>24.9/14.4 kV</u> <u>50 amp*</u>
RTE	Transformer	32-2674A03	32-2674A06

\*These combinations contain the open-link type of cutout.

az  
July 1987

az - Pole Numbers and Letters, Metal

(See Drawing M52-3)

Manufacturer

Almetek Industries, Inc.

Premax Products

Catalog No.

"E-Z Tags"  
Order by description

1523

ba  
July 1987

ba - Bolt, Angle Eye

Thimble Type

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes : 5/8 inch, 6 through 12 inch length  
3/4 inch, 8 through 12 inch length

The following manufacturers have shown compliance with the applicable specifications:

A. B. Chance Company  
Dixie Electrical Manufacturing Company  
Joslyn Mfg. and Supply Company  
Kortick Manufacturing Company  
\*McGraw-Edison  
Utilities Service Company



\*"Static proof" designs available.

bb  
July 1987

bb - Brace, sidearm vertical

26" brace  
24" bolt-hole spacing

50" brace  
24" bolt-hole spacing

Dixie	06986	06987
Joslyn	J1536	J1537
Kortick	K1931	K1932
McGraw-Edison	DB1V1	DB1V3
Utilities Service	5249	5250

be-1  
July 1987

be - Recloser, oil circuit  
12.5/7.2 kV

Lexington  
Switch and  
Controls

- Single phase - A Line, Model B, ratings 5-50 amperes, maximum interrupting capacity 1250 amperes.  
Single phase - A Line, Model D, ratings 25-100 amperes, maximum interrupting capacity 2000 amperes.  
Single phase - A Line, Model K, ratings 25-100 amperes, maximum interrupting capacity 4000 amperes.

McGraw-Edison

- Single phase - Type H, ratings 5-50 amperes, maximum interrupting capacity 1250 amperes.  
Single phase - Type 4H, ratings 5-100 amperes, maximum interrupting capacity 2500 amperes.  
Single Phase - Type L, ratings 25-100 amperes, maximum interrupting capacity 2500 amperes.  
Three phase - Type 6H, ratings 5-100 amperes, maximum interrupting capacity 2500 amperes.  
\*Three phase - Type RX, ratings 25-400 amperes, maximum interrupting capacity 6000 amperes.  
\*Three phase - Type H, ratings 100-560 amperes, maximum interrupting capacity 10,000 amperes.  
\*#Three phase - Type RXE, rating 400 amperes, maximum interrupting capacity 6000 amperes.  
\*#Three phase - HE, rating 560 amperes, maximum interrupting capacity 10,000 amperes.  
\*#Three phase - ME, ratings 560 or 1120 amperes, maximum interrupting capacity 16,000 amperes.

24.9/14.4 kV

McGraw-Edison

- Single phase - Type E, rating 5-100 amperes, maximum interrupting capacity 2500 amperes. Available with shunt lockout solenoid for three-phase operation.  
\*#Three phase - Type RVE, rating 400 amperes, maximum interrupting capacity 6000 amperes.  
\*Three phase - Type HV, ratings 560 amperes, maximum interrupting capacity 8000 amperes.  
\*#Three phase - type HVE, rating 560 amperes, maximum interrupting capacity 8000 amperes.  
\*Single phase - Type 4E, rating 50-280 amperes, maximum interrupting capacity 4000 amperes.  
\*#Three phase - Type CXE, rating 560 amperes, maximum interrupting capacity 16,000 amperes, maximum voltage 34.5 kV

\* Ratings greater than 100 amp. for 12.5/7.2 kV application, and greater than 200 amp. for 24.9/14.4 kV application, are acceptable only with ground trip device.

# Not acceptable with load current, bushing Ct battery chargers.

be-2  
July 1987

be - Reclosers, Vacuum interrupter  
12.5/7.2 kV

McGraw-Edison

\*#Three phase - Type VSA, ratings  
100 - 560 amperes

\* Ratings greater than 100 amp. for 12.5/7.2 application, and greater than 200 amp. for 24.9/14.4 kV application, are acceptable only with ground trip devices.

#Not acceptable with load current, bushing CT battery chargers.

Conditional List  
be(1)  
July 1987

be - Recloser, oil circuit  
12.5/7.2 kV

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>*Lexington Switch and Controls</u>		
Three phase oil circuit recloser, 50, 100 and 280 ampere frames, A Line, Model 3B (5-5- Amperes)	808 (1/7/65) 1087 (4/1/76) 1329 (10/9/86)	To obtain operating experience.
Model 3D (5-100 Amperes)		
Model 3K (25-28 Amperes)		
<u>*Westinghouse</u>		
Three phase oil circuit recloser (Shunt trip with static or relay type controls)		To obtain operating experience.
Type ES-400 (15-400 amperes)	1070 (7/24/75)	
Type ES-560 (15-560 amperes)		
Type ESM-560 (100-560 amperes)		
Type ES-105 (15-560 amperes)	1077 (11/13/75)	

24.9/14.4 kV

<u>*Lexington Switch and Controls</u>		
Oil circuit recloser, Single phase-A Line, Model M rated 100 amperes	620 (4/18/57) 1080 (12/23/75)	To obtain operating experience.
Three phase-A Line, Model 3M rated 100 amperes	1329 (10/9/86)	

\*Ratings greater than 100 amp. for 12.5/7.2 kV application, and greater than 200 amp for 24.9/14.4 kV application, are acceptable only with ground trip devices.

Conditional List  
be(2)  
July 1987

be - Reclosers, vacuum interrupter

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
*McGraw-Edison Single phase, type V4H, maximum voltage 14.4 kV for 12.5/7.2 and 13.2/7.62 kV	921 (6/26/69)	To obtain experience.
Three phase, type V6H, maximum voltage 14.4 kV for 12.5/7.2 and 13.2/7.62 kV	921 (6/26/69)	To obtain experience.
Three phase type VH rated 560 amperes continuous, maximum voltage 14.4 kV for 12.5/7.2 and 13.2/7.62 kV	1005 (12/7/72)	To obtain experience.
#Three phase type VHE rated 560 amperes continuous, maximum voltage 14.4 kV for 12.5/7.2 kV and 13.2/7.62 kV	1005 (12/7/72)	To obtain experience.
#Three phase type VWHE rated 560 amperes continuous, maximum voltage 27 kV for 24.9/14.4 kV	1014 (4/12/73)	To obtain experience.

\*Ratings greater than 100 amp. for 12.5/7.2 kV application, and greater than 200 amp. for 24.9/14.4 kV application, are acceptable only with ground trip devices.

#Not acceptable with load current, bushing CT battery chargers.

Conditional List  
be(3)  
July 1987

be - Reclosers, vacuum interrupter

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
*McGraw-Edison (Cont.) Three phase type VHV rated 560 amperes continuous, maximum voltage 27 kV for 24.9/14.4 kV	1021 (7/19/73)	To obtain experience.
<u>Westinghouse</u>		
Three phase Type ESVA rated 560/800 amps continuous, 12,000 amps symmetrical, maximum voltage 15.5 kV for 12.5/7.2 kV	1259 (5/19/83)	To obtain experience.
Three phase Type ESMVA rated 560 amps continuous, 16,000 amps symmetrical, maximum voltage 15.5 kV for 12.5/7.2 kV	1259 (5/19/83)	To obtain experience.
Three phase Type ESV rated 800 amps continuous, maximum voltage 38 kV for 24.9/14.4 kV	1117 (6/23/77) 1239 (7/29/82)	To obtain experience.

\*Ratings greater than 100 amp. for 12.5/7.2 kV application and greater than 200 amp. for 24.9/14.4 kV application, are acceptable only with ground trip devices.

bh  
July 1987

bh - Clevis, Service Deadend

Applicable Specification: "REA Specification for Service Deadend Clevises," D-8

<u>Manufacturer</u>	<u>Clevis Only*</u>	<u>Clevis with dry process spool</u>	<u>Clevis with wet process spool</u>
Chance	0341	0341-0606	0341-C909-1931
Dixie	D0341	D0341-D	D0341-H
Joslyn	J0313	J0314	-
Kortick	K9250	K9100	K9099
McGraw-Edison	DC3F1	-	-
Utilities Service	32136	31136	36136

\*Catalog number does not include spool; for spool see Page cm.

b1  
July 1987

**b1 - Gain, Pole**

**For use with rectangular crossarms**

Chance	4092
Continental	CAG-44-5
Flagg (MIF)	PX252
Joslyn	J4092

**For braceless crossarms (narrow profile construction)**

Bethea Electrical	GCAF-6A
Continental	DEA-65-10A
Flagg (MIF)	PX182A

**Transmission**

**Grid Gains**

	<u>Sizes in inches</u>	
	<u>4" x 4"</u>	<u>4" x 9"</u>
Barron Bethea	PG-44	PG-945
Bethea Electrical	GSF-44-7	GSFT-95-7
Continental	GGSF-4040-7	GRF-9045-7
Flagg (MIF)	PX122	PX260
Joslyn	J6064	J22533-A

bj  
July 1987

bj - Guy Hook

Applicable Specification: Edison Electric Institute Specification TD-11  
1951, "Specifications for Guy Hooks and Guy Strain  
Plates."

Dixie	D6584
Joslyn	J1019
Kortick	K4031
McGraw-Edison	DG4H1
Utilities Service	5310
Chance	6584



bk  
July 1987

Ju

bk - Guy Plate

Applicable Specifications:

Strain Type: Edison Electric Institute Specification TD-11  
1951, "Specifications for Guy Hooks and Guy  
Strain Plates."

Lift Type: None

	<u>Strain Type</u> <u>4" x 8" x 14 gage</u>	<u>Lift Type</u> <u>2-1/2" x 7" x 1/4", 2 hole</u>
Chance	6575	7898
Dixie	06575	D7888
Joslyn	J1034	J7894
Kortick	K4015	K3511
McGraw-Edison	DG1M2	DG4M2
Power Line Hardware	GSP-1	
Utilities Service	5351	C434



bn  
July 1987

bn - clamp, loop deadend

For ACSR

	<u>3/0</u>	2/0	1/0	2	4
ALCOA	-	413	413	412	411
Anderson/Sq. D	LC-74B	LC-71B	LC-70B1	LC-70B	LC-70B
Bethea Electrical	ALD-7373-U	ALD-34-U	ALD-1313-U	ALD-1313-U	ALD-1313-U
Blackburn	DLC23	DLC2106	DLC2106	DLC2106	DLC2106
Burndy	-	-	UW25R	UW2R	UW2R
C & R	-	-	CRLD-10	CRLD-10	CRLD-10
Electrical Specialty Products	LD-4	LD-2	LD-1	LD-1	LD-1
Fargo	GA-145	GA-145	GA-144	GA-144	GA-144
Weaver	-	-	HDE-10	HDE-2	HDE-2



bo  
July 1987

bo - Shackle, anchor

<u>Manufacturer</u>	<u>Catalog Number</u>
Anderson/Sq. D	AS-25
Bethea Electrical	ASH-45
Chance	5801
Continental	AS-25-5-4
Dixie	D5801
Flagg	12300
Joslyn	J2742
Kortick	K4481
Lapp	33852
Lindsey	3260
McGraw-Edison	DC7J1
Power Line Hardware	AS-1
Sur-Loc, Inc.	5500
Utilities Service	4106

br  
July 1987

br - Chain Link (End Link)

<u>Manufacturer</u>	<u>Catalog Number</u>
Bethea Electrical	CL-5
Continental	L-5
Joslyn (Brewer-Titchener)	BT-3082-HT
Lapp	6415-HT
Lindsey	3403

bs  
July 1987

bs - Bolt, single upset

Applicable Specifications: "REA Specifications for Single and Double Upset Spool Bolts," D-5

Diameter, inches	5/8	5/8	5/8	5/8
Length, inches	7	8	9	10
Chance		7741	7741-1/2	7742
Dixie	D7740	D7741	D7741-1/2	D7742
Joslyn	-	J2342-1/2	J2343-1/2	J2344-1/2
Kortick	K4929	K4950	K4930	K4951
McGraw-Edison*		DC2E3	DC2E4	DC2E5
Utilities Service	3105-1/2	31053	31053A	31054

\*"Static proof" designs available.

bt  
July 1987

bt - Wireholder, clevis type  
with No. 24 wood screw

(For use with triplex type service cable, Drawing K10C-A)

Chance	0192*
Dixie	D075*
Joslyn	J075*
McGraw-Edison	DW5R1*

\*Catalog number does not include insulator. Use secondary type spool  
insulator with 1-3/4-inch groove diameter. See page cm.

bu  
July 1987

bu - Connector, grounding  
for transformer or other equipment

<u>Manufacturer</u>	<u>Copper Alloy 1</u>	<u>Plated Copper Alloy 2</u>	<u>Aluminum Alloy 3</u>
Anderson/Square D	GTCL-23A	GTCL-23A-TP	
Blackburn	TTC-4	TTC2P	
Burndy	EQC632C	EQC632C-TN	
Dossert	TGCL8-50	TGCL8-50-SN	
Fargo	GC-207	GC-207P	GA-220
Penn-Union		GSE-C1TN	
Power Line Hardware	TGL-110	TGL-110P	
Tanner		GET-1-TN	
Heaver	TGC-4	TGC-2P	

1 - For use with copper type ground wire.

2 - For use with both copper and aluminum type ground wire.

3 - For use with aluminum type ground wire.

bv  
July 1987

bv, Rods, armor

(includes standard, double insulator, and tapping rods)

Aluminum or aluminum alloy rods for use on ACSR

Blackburn	Formed Type
Chance	Formed Type
Dulmison	Formed Type
Helical Line Products	Formed Type
Preformed Line Products	Formed Type

Copperweld rods for copper or CWC conductor

Helical Line Products	Formed Type
Preformed Line Products	Formed Type

Alumoweld rods for aluminum clad steel (Alumoweld)  
overhead ground wire

Helical Line Products	Formed Type
Preformed Line Products	Formed Type

bx  
July 1987

bx - Splice, automatic

<u>Copper</u>	<u>Burndy</u>	<u>Fargo</u>	<u>Reliable</u>
6	ADS6S	GL-111	61
4	ADS4S	GL-112	41
2 x 3		GL-115	-
1/0 x 7	ADS1/0	GL-117	107
2/0 x 7	ADS2/0	GL-118	207
3/0 x 7	ADS3/0	GL-119	307
4/0 x 7	ADS4/0	GL-120	407

CWC

8A		GL-112	
6A	ADS4	GL-113	47
4A	ADS2	GL-115	27
2A		GL-117	

ACSR      ADS-R Series\*    GL-400 Series\*    7650 Series\*

Aluminum Alloy  
(6201 and 5005)

GL-100A Series   AL55 Series  
GL-1000A Series

\*For use on distribution conductors 4/0 and smaller only.

Conditional List  
bx  
July 1987

bx - Splice, automatic

DISTRIBUTION

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Fargo		
AWAC 4 - 4/3	1087 (4/1/76)	1. To obtain experience 2. For use on distribution systems only.
GLA-105		
AWAC 2 - 4/3		
GLA-110		
AWAC 1/0 - 4/3		
GLA-115		
266.8 kcmil ACSR 18/1	B55 (2/12/86)	Same as above.
GL-1315A		
336.4 kcmil ACSR 18/1		
GL-1315A		
477 kcmil ACSR 18/1		
GL-1325A		

by  
July 1987

by - Deadend, Automatic and Formed Type

Conductor Size

<u>Cu</u>	<u>CWC</u>	<u>Fargo</u>	<u>Reliable</u>
-	4A	GD-515	27-SDS
-	6A	GD-513	47-SDS
-	8A	GD-512	-
2 x 3	-	GD-515	271
4	-	GD-512	41LD
6	-	GD-511	61LD

ACSR

\*Fargo GD-400 Series

\*Preformed OG-9360 thru 9366  
#OHDE-9534 thru 9540, 4577

\*Reliable 7650 Series

#may only be used with a spool insulator (Item cm) and appropriate clevis for neutral and secondary applications.

Aluminum Alloy  
(6201 and 5005)

Fargo GD-A Series

Preformed OG-9360 thru 9366

Reliable AL Series

\*For use on distribution conductors 4/0 and smaller only.

Conditional List  
by  
July 1987

by - Deadends, automatic and formed type

FORMED TYPE

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
---------------------	---------------------------------	-------------------

Preformed Line Products

AWAC 4 - 4/3  
DG-4560  
AWAC 2 - 4/3  
DG-4562  
AWAC 1/0 - 4/3  
DG-4565

993 (6/8/72)

To obtain experience.

AUTOMATIC TYPE

Reliable

AWAC 4 - 4/3  
5201  
AWAC 2 - 4/3  
5202  
AWAC 1/0 - 4/3  
5204

1026 (9/27/73)

To obtain experience.

Fargo

AWAC 4 - 4/3  
GDA-235  
AWAC 2 - 4/3  
GDA-240  
AWAC 1/0 - 4/3  
GDA-245  
266.8 kcmil ACSR 18/1  
GD-5315A  
336.4 kcmil ACSR 18/1  
GD-5315A  
477 kcmil ACSR 18/1  
GD-5325A

1087 (4/1/76)

To obtain experience.

1. To obtain experience  
2. For use on distribution lines only.

bz  
July 1987

bz - Switch, oil

12.5/7.2 kV

	<u>Type</u>	<u>Description</u>
General Electric	FKC-2 FKC-2*	Single and three-phase, manual, 200 amp. Single and three-phase, remote control, 200 amp.
McGraw-Edison	NR*	Single-phase, remote elec. control, 200 amp.
	VR*	Three-phase, remote elec. control, 400 amp.
Hestinghouse	CSL**	Single-phase, manual and remote manual or elec. control, 200 amp. Three-phase, remote manual or elec. control, 200 amp.

\*Control equipment should be selected in accordance with the requirements of individual installations.

\*\*This item is also available in a special design for use in areas where corrosion is a serious problem.

Conditional List  
bz  
July 1987

bz - Switch, oil

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>McGraw-Edison</u> Capacitor oil switch Type TSC, 38 kV max. 100 ampere capacitor switch 300 ampere load switch	940 4/2/70	To obtain experience.
Oil switch with 125 kV BIL accessory Type NR, 15 kV, single- phase, remote electric control, 200 amp. at 75 to 100 percent power factor	1046 7/25/74	1. To obtain experience. 2. For use on single- phase taps of 24.9/14.4 kV multi- grounded wye systems.
<u>South Bend Controls, Inc.</u> Capacitor, oil switch Type CSD-95, 95 kV BIL 15 kV Max. 200amp.	1284 8/2/84	To obtain experience
Oil switch with 125 kV BIL accessory, CSD-125, 15 kV, single-phase, 200 amp	1290 11/29/84	1. To obtain experience 2. For use on single- phase taps of 24.9/14.4 kV multi- grounded wye systems.

Manufacturer	CG - Switch, air, three-pole, group-operated			Center Break Type IV	Double Break Type IV
	Acceptable Mounting on Structures	Tilting Ins. Type IV	Vertical Break Type IV		
Brown Boveri Electric (ITE)	Horizontal			TTR6	15-345
A. B. Chance	Horizontal Phase over Phase				
Johnson	Horizontal			VIP	15-230
Joslyn (Hi-Voltage)	Horizontal			RF-2(VL) 15-230	RB-1(VL) 15-25
Kearney	Horizontal			AR 60-P 15-69	RB-1 15-115
MEMCO	Horizontal	Agf Agc	15-69 15-69	EA	15-345
G & W Electric Co.	Horizontal			HK-40	15-69
Poweryne (Kearney)	Horizontal Phase over Phase			PHB-40A	15-69

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

\*These switches may be purchased with reduced voltage vacuum interrupters and may be applied for loop sectionalizing duty when peak recovery voltage does not exceed 25 kV  
 NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

Acceptable Mounting on Structures		Tilting Ins. Type	Vertical Break Type	Side Break Type	Center Break Type	Double Break Type
Manufacturer		kV	kV	kV	kV	kV
S & C	Horizontal Phase over Phase	Aldutii(L) 15-34.5	Aldutii(L) 15-25	Aldutii(L) 15-25	Aldutii(L) 34.5-46	Aldutii(L) 34.5-46
	Vertical	Aldutii(L) 15-25	Aldutii(L) 15-25	Aldutii(L) 15-25	Aldutii(L) 34.5-46	Aldutii(L) 34.5-46
	Phase over Phase	Aldutii(L)* 15-34.5	Aldutii(L) 15-25	GOABS(VL) 15-69		
SEECO	Horizontal	TA(VL) 15-69	SSB-T 15-69	CCB-115-230		
		AVB(VL)* 115-345		CBL-2 115-230		
	Horizontal	EV 15-230	57K 15-69	EC 115-230		
Siemens-Allis	Horizontal Phase over Phase		(1D, 2D, 3D)(VL) 15-161			
	Horizontal	TH1(VL) 15-161				
	Horizontal					
Southern States	Horizontal					
	Horizontal	AGT(VL)* 15-230	GSH-4(VL) 15-138	AGCH-** 15-345		
	Phase over Phase		GSH-4(VL) 15-138	AGCH-V=** 34.5-230		
Turner	Horizontal			GCH 15-23		
	Horizontal					
	Horizontal					
USCO	Horizontal					
	Horizontal					
	Phase over Phase					

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

\*These switches, except 34.5 kV Aldutii vertical break, are available and accepted with the S & C type SMD substation fuse cutouts listed on page af-3.

\*\* Also available in bronze in some ratings.

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg-3  
July 1987

cg - Switch, air, three pole, group operated

(FOR USE ON STEEL SUBSTATION STRUCTURES)

<u>Manufacturer</u>	<u>Mounting</u>	<u>Vertical</u> <u>Type</u>	<u>kV</u>	<u>Side Break</u> <u>Type</u>	<u>kV</u>
Chance	Vertical Horizontal			D7(L)	15-27
S & C	Phase-over-Phase	Alduti(L) 34.5 (200 kV BIL)		Alduti(L) 34.5 (200 kV BIL)	
	Vertical	Alduti (L) 34.5 (200 kV BIL)			

(L) Means gas or solid material full-load interrupters are accepted and available.

cg - Switch, air, three-pole, group operated

(not Suitable for Substation Use)

<u>Manufacturer</u>	<u>Acceptable Mounting</u>	<u>Vertical Break Type</u> <u>kV</u>	<u>Side Break Type</u> <u>kV</u>	<u>Center Break Type</u> <u>kV</u>
Chance	Horizontal Phase over Phase Vertical	D6(L) 15-34.5 D6(L) 15-34.5 D7(L) 15-34.5		
Kearney/KPF	Horizontal Phase over Phase Phase over Phase Phase over Phase	SV-202 23	A202-A208 15-110 A202(L) 15-21 W202(L) 15-21 HD202(L) 15-21	
Powerdyne (Kearney)	Horizontal Phase over Phase	V2	V2	15-23 15-23

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg-5  
July 1987

cg - Switch, three-pole, group-operated  
(Factory Preassembled)

<u>Manufacturer</u>	<u>Acceptable Mounting on Structures</u>	<u>Vertical Break Type</u>	<u>Side Break Type</u>	<u>kV</u>
Chance	Horizontal (A)	07(L)15-27	07(L)15-27	07(L)15-27
	Phase over phase (A)			
	Vertical (A)			
	Horizontal (B)	07(L)34.5 (200 KV BIL) #	07(L)34.5 (200 KV BIL) #	07(L)34.5 (200 KV BIL) #
	Phase over phase (B)			
	Vertical (B)			
Kearney/KPF	Horizontal (A)	GB202-H(L) 15-25	GB202-V(L) 15-25	
	Phase over phase (A)			
S & C	Horizontal (A)	A1dut1(L)15-25	A1dut1(L)25	A1dut1(L)15-25
	Phase over phase (A)			
	Vertical (A)			
	Phase over phase (B)	A1dut1(L)34.5 (200 KV BIL) #	A1dut1(L)34.5 (200 KV BIL) #	
	Vertical (B)	A1dut1(L)34.5 (200 KV BIL) #		
Westinghouse	Horizontal (A)			SLB-3(L)15-25

(L) Means gas or solid material full-load interrupters are accepted and available.

# Accepted for transmission use only, provided the steel crossarm base is grounded with an adequate grounding connector.

(A) Not suitable for substation use.

(B) NEMA standard switches for station and line structures.

NOTE: Switches with factory-assembled crossarm type bases must have nonconducting crossarm type bases, nonconducting braces, and insulated interphase and control rods, except as otherwise noted.

Conditional List  
cg(1)  
July 1987

cg - Switch, air, three-pole, group operated

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Southern States</u> "Pole-Pak" 15-23 kV	800 (8/20/64)	To obtain experience.
Type ES; 15, 23 and 34.5 kV (horizontal upright models only)	897 (7/11/68)	<ol style="list-style-type: none"><li>1. To obtain experience.</li><li>2. For 15 kV and 23 kV distribution lines: insulated interphase and control rod spacers required. See REA Drawings M3-15 and VM3-16</li><li>3. NEMA insulators and steel interphase base required for transmission line structure as in TM-3.</li><li>4. Acceptable on steel substations 15 through 34.5 kV with NEMA insulators and uninsulated interphase rods.</li></ol>
Type 57L sidebreak, 115-161 kV, 600 and 1200 amp., horizontal upright	1067 (6/12/75)	To obtain experience.
<u>G &amp; W Electric Company</u> Type MK-40A 15 kV through 230 kV (horizontal upright mounting)	912 (2/20/69)	<ol style="list-style-type: none"><li>1. To obtain experience.</li><li>2. Insulated interphase and control rods required on 15 kV and 23 kV models used on wood structures.</li><li>3. Steel interphase base required when mounted as in REA Drawing TM-3.</li></ol>

Conditional List  
cg(2)  
July 1987

cg - Switch, air, three-pole, group-operated

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
G & W Electric Company (Cont'd) "Mark 40" 115 kV through 345 kV (horizontal upright mounting)	1005 (12/7/72)	To obtain experience.
Type LPV, 3-pole 72.5-272 kV, 1200 amp., 1600 amp., 2000 amp., center sidebreak for horizontal mounting.	1064 (5/1/75)	To obtain experience.
<u>Siemens-Allis</u> Type CBL-T, 15-69 kV 600 and 1200 amp (center break, horizontal upright mounting)	1100 (10/21/76)	1. To obtain experience. 2. Insulated interphase and control rods required on 15 kV and 25 kV models used on wood structures.
<u>Morgan</u>		
Type VBV(VL), Vertical break vee Pole top mtg., 15-34 kV H-frame mtg., 46-230 kV Substation mtg., 15-230 kV	1056 (1/2/75) 1146 (8/31/78) 1281 (5/31/84)	1. To obtain experience. 2. Pole mounted switches must be supplied with insulated interphase and control rods.
Type CBV, center break vee Horizontal pole top mounting, 15-34.5 kV Phase-over-Phase mounting, 15-23 kV H-frame and substation mounting, 15-230 kV	1056 (1/2/75) 1281 (5/31/84)	Same as above.

(L) Means full-load interrupter accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

Conditional List  
cg(3)  
July 1987

cg - Switch, Air, Three-Pole, Group Operated

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
SEECO GOABS (VL) Vacuum interrupter type 115-161 kV	1201 (12/4/80)	To obtain experience.
S & C Line-rupter with SF <sub>6</sub> inter- rupter. Horizontal mounted 69-230 kV Vertical mounted 69-161 kV	1202 (12/18/80)	To obtain experience.

(L) Means full-load interrupter accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

ci  
July 1987

ci - Clevis, Thimble, Side-Opening

Numbers listed will accommodate:

- No. 6 thru 2/0 Copper
- No. 8A thru 2A Copperweld-Copper
- No. 4 thru 3/0 ACSR

Joslyn (Brewer Titchener) 2401

cj  
July 1987

**cj - Pole Ground Wire**

Soft annealed iron, BB Grade, class C galvanizing  
(For pole protection only)

<u>Manufacturer</u>	<u>Size</u>
Bethlehem Steel	3-wire, 5/16 inch
Indiana Steel and Wire	3-wire, 5/16 inch
Southwire	3-wire, 5/16 inch
U. S. Steel	3-wire, 5/16 inch

Copper, soft annealed solid  
ASTM Specification B3

Manufacturer  
(See page av-2)

Aluminum (for above ground use only)  
Three-quarter hard-drawn EC grade

Manufacturer  
(See page av-1)

Aluminum Alloy (for above ground use only)

<u>Manufacturer</u>	<u>Type</u>
ALCAN	6201
ALCOA	6201
American Electrical	6201
Kaiser	6201
Reynolds	5005
Southwire	6201, 5005

Copper-Clad Steel, Annealed 40 percent Conductivity

<u>Manufacturer</u>	<u>Size</u>
Copperweld*	No. 6

\* Not for use on distribution when neutral is larger than #10 ACSR.

Conditional List

cj

July 1987

cj - Pole Ground Wire  
Aluminum Alloy (for above ground use only)

Manufacturer

ALCOA  
8177

Meeting No.  
and Date

1248 (12/2/82)

Conditions

To obtain experience.

ck  
July 1987

ck - clamp, anchor rod bonding

For Standard and Drive Type Rods

<u>Diam. of Rod</u>	<u>Type of Eye</u>	<u>5/8"</u>	<u>3/4"</u>	<u>1"</u>
C & R Products	Single	CRBC-1	CRBC-1	CRBC-1
	Twin	CRBC-2	CRBC-2	CRBC-2
	Triple	-	CRBC-3	CRBC-3
Chance	Single	G5060	G5060	G5060
	Twin	G5061	G5061	G5061
	Triple	-	G5063	G5063
Dixie	Single	D3143	D3143	D3143
	Twin	-	D3144	D3144
	Triple	-	D3145	D3145
Joslyn	Single	3230	3230	3230
	Twin	-	3231	3231
	Triple	-	3233	3233
Kortick	Single	K3147	K3147	-
	Twin	-	K3148	K3148
	Triple	-	K3149	K3149
McGraw-Edison	Single	DA1B1	DA1B1	DA1B1
	Twin	DA2B1	DA2B1	DA2B1
Utilities Service	Single	CG5060	CG5060	-
	Twin	-	CG5061	CG5061
	Triple	-	CG5063	CG5063

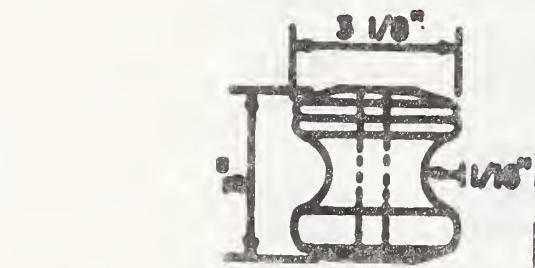
For Power Installed Screw Anchors

C & R Products	Single	CRBC-4	CRBC-5	-
Chance	Single	G5067	G5068	-
Joslyn	Single	PIBC-4	PIBC-5	-

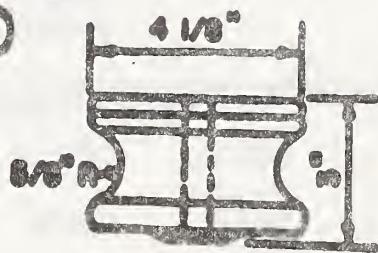
CM  
July 1987

cm - Insulator, Spool

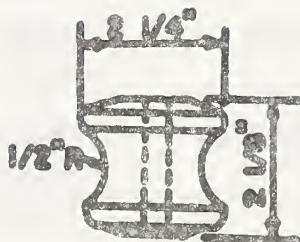
Type:	<u>Secondary (Wet Process)</u>		<u>Service</u>	
	<u>Wet Process</u>	<u>Dry Process</u>		
Groove Diameter:	<u>1-3/4"</u>	<u>3"</u>	<u>1-3/8"</u>	<u>1-3/8"</u>
Chance	C909-1032	C909-1034	C909-1031	0606
Hughes	2102	-	-	-
Joslyn	J151	J0101	J150	J100
Kortick	K516	K522	K513	K514
McGraw-Edison	DE4S3	DE5S3	DE2S2	DE2S1
Porcelain Products (Knox)	5101	5119	5107	5207
Universal	1082	-	-	-
Utilities Service	205	31221	208	207
Victor Insulators, Inc.	2012	2026	2011	-



1-3/4" Groove Diameter



3" Groove Diameter



1-3/8" Groove Diameter

cp-1  
July 1987

### **cp - Deadend, Compression Type**

ACSR

<u>Conductor Size</u>	<u>Alcoa</u>	<u>Anderson/Sq. D</u>
1/0	Order by	VCD-50R
2/0	Conductor	thru
3/0	Size and	VCD-61R
4/0	<u>Stranding</u>	"
266.8 kcmil 18/1		VCD-80-R
336.4 kcmil 18/1		VCD-80-R
477 kcmil 18/1		VCD-812-R
266.8 kcmil 26/7	2-piece	VCD-831-1-RM
336.4 kcmil 26/7	alloy	VCD-831-1-RM
477 kcmil 26/7	compression	VCD-832-2-RM
556.5 kcmil 26/7	Type VES or	VCD-833-3-RM
795 kcmil 26/7	HES	VCD-835-4RM
954 kcmil 54/7	"	VCD-835-4RM

<u>Conductor Size</u>	<u>Burndy</u>	<u>Fargo</u>	<u>Kearney</u>	<u>Homac</u>
1/0	Type Y-W	SEDA-8129	104000	Order by
2/0	"	SEDA-7729	thru	Conductor
3/0	"	SEDA-7829	104000-03	Size and
4/0	"	SEDA-7929	"	Stranding
266.8 kcmil 18/1				"
336.8 kcmil 18/1				"
477 kcmil 18/1				"
266.8 kcmil 26/7	"	Uni-Grip	104000-05	
336.4 kcmil 26/7	Type YTW	one die	thru	
477 kcmil 26/7	"	system	104000-14	
556.5 kcmil 26/7	"	Order by	"	"
795 kcmil 26/7	"	conductor size		
954 kcmil 54/7	"	and stranding		

cp-2  
July 1987

cp - Deadend, Compression Type

ACSR  
Adjustable

Fargo  
Homac

Order by conductor size and stranding

Aluminum Alloy  
(6201 and 5005)  
4 thru 4/0

Conductor Size:

Anderson/Sq. D

Type VCD, Order by conductor size.

Conductor Size:

	<u>Copper</u>	<u>4</u>	<u>6</u>
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National Tel. Supply

71-258/3X	71-204-P	71-162-J
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Conductor Size:

	<u>Copperweld-Copper</u>	<u>8A</u>
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National Tel. Supply

71-6A-P	71-8A-P
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Conditional List

cp

July 1987

cp - Deadend, compression type

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Burndy AWAC 4-4/3 YTW7M10T AWAC 2-4/3 YTW7M9T AWAC 1/0-4/3 YTW7M7T	1050 (9/19/74)	To obtain experience.

CQ  
July 1987

CQ - Deadend, Secondary

(For use on secondary deadends only)

Copper  
Offset Compression

Conductor Size:

4 6

National Telephone Supply

91-204-P 91-162-J

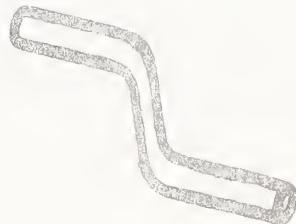
Copperweld-Copper  
Offset Compression

Conductor Size:

6A 8A

National Telephone Supply

91-6A-P 91-8A-P



Copperweld-Copper  
Automatic Deadend

Conductor Size:

6A 8A

Reliable

47FD

cr  
July 1987

cr - Bracket, Angle Suspension

Applicable Specifications: "REA Specification for Angle Suspension Brackets," DT-4

<u>Manufacturer</u>	<u>Distribution</u> <u>5/8" Diam.</u>	<u>Transmission</u> <u>3/4" Diam.</u>
Chance		5728
Joslyn	J7935	J7936
Kortick	K6231	K6230
McGraw-Edison	DC8E1	
Utilities Service	545	546

Angle Bracket, Swinging

Applicable Specification: T-8  
Drawing : TM-111A, TM-111B

Swinging angle bracket with hardware and fittings (for 230 kV transmission)

<u>Manufacturer</u>	<u>TM-111A</u>	<u>TM-111B</u>	<u>Type #1</u>	<u>Type #2</u>
American Crossarm & Conduit Company	AC8801	AC8802	X	X
Brooks	64233A	64233B	X	
Hughes	2848	2848	X	X
Joslyn	REA 64-8A	REA 64-8B	X	

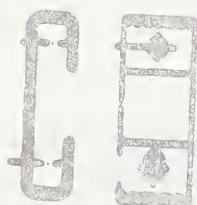
CS  
July 1987

CS - Bracket, Pole Top Pin

For Transmission and 26.9/14.8 KV Distribution

Applicable Specifications: "REA Specifications for Pole Top  
Brackets for Channel Type Pins,"  
D-14

Chance	2157
Joslyn	32045
Kortick	K8130
McGraw-Edison	DP3A1
Utilities Service	36690



ct  
July 1987

ct - Plate, Double Arming

Transmission

<u>Manufacturer</u>	<u>4" x 1/2" x 24"</u>	<u>4" x 1/4" x 17"</u>
Chance	5844	5819
Dixie	D5844	D5845
Joslyn	J1600	J1607
Kortick	K1454	K1465
McGraw-Edison	DP21A1	DP23A3
Power Line Hardware	-	DAP-17
Utilities Service	4117	-

cu  
July 1987

cu - Brace, crossarm, wood

Span, inches	60	60
Drop, inches	<u>18</u>	<u>30</u>
Aluma-Form	6018	6030
American Crossarm & Conduit Company	320	325
Brooks Lumber Company	44680	44681
Cascadian Company	15018	15030
Dis-Tran	DT-60R	DT-60R
Hatheway Patterson	320-R	325-R
Hughes Brothers	2045-CC	2045-D
Joslyn	J4760R	J4730W-R
Utilities Structures Engineering Incorporated	CU-60-18	CU-60-30

Braces listed below have 26-inch hole spacing. They are to be used in place of the flat steel braces previously listed on page h.

Aluma-Form	AF626
American Crossarm & Conduit	600
Brooks Lumber Company	58128
Dis-Tran	DT-28
Hatheway Patterson	7026
Hughes Brothers	2023
Joslyn	J5526

Brace, crossarm, fiber reinforced plastic

Continental	CRB-28
Hughes Brothers	533
Joslyn	RP-26
Tranpol	CAB-28
Stanley Flagg	FCB26

CX  
July 1987

CX - Splice, oval tube

Copper

<u>Conductor Size:</u>	<u>0 x 7</u>	<u>2 x 3</u>	<u>4</u>	<u>6</u>
National Tel. Supply	464	463	459	457

Copperweld-Copper

<u>Conductor Size:</u>	<u>6A</u>	<u>8A</u>
National Tel. Supply	460	459

cy-1  
July 1987

cy - Splice, Compression  
ACSR

Conductor <u>Size</u>	<u>Alcoa</u>	<u>Anderson/</u> <u>Sq. D</u>	<u>Burndy</u> "Unislice" (1-piece) or Y-S (2-piece)
4 6/1	2-piece	VC-36R	
4 7/1	Order	VC-36R	
2 6/1	by	VC-36R	
2 7/1	Conductor	VC-36R	
1/0	Size	VC-50R	Order by
2/0	and	VC-50R	Conductor
3/0	Stranding	VC-61R	Size and
4/0	"	VC-61R	Stranding
266.8 kcmil 18/1		VC-80-R	
336.4 kcmil 18/1		VC-80-R	
477 kcmil 18/1		VC-90-R	
266.8 kcmil 26/7	2-piece	VC-831-1-RM	2-piece
336.4 kcmil 26/7	Compression	VC-831-1-RM	Type YTS
477 kcmil 26/7	Alloy Type	VC-832-2-RM	"
556.6 kcmil 26/7	CJ	VC-833-3-RM	"
795 kcmil 26/7		VC-835-4RM	"
954 kcmil 54/7		VC-835-4RM	"

Conductor <u>Size</u>	<u>Fargo</u>	<u>Blackburn</u>	<u>Kearney</u>	<u>2 pc.</u>	<u>1 pc.</u>
4 6/1		Type RC			OH4-61-71AS
4 7/1		1-piece			OH4-61-71AS
2 6/1		Order			OH2-61-71AS
2 7/1		by			OH2-61-71AS
1/0	TJA-8129	Conductor	OH1/0-61A		OH1/0-61AS
2/0	TJA-7729	Size	OHR2/0-61A		
3/0	TJA-7829	and	OHR3/0-61A		
4/0	TJA-7929	Stranding	HR4/0-61A		
266.8 kcmil 18/1		#4 to 4/0			
336.4 kcmil 18/1					
477 kcmil 18/1					
266.8 kcmil 26/7	Uni-grip			HR-266-267A	
336.4 kcmil 26/7	one die			HR336-267A	
477 kcmil 26/7	system			HR-477-267A	
556.5 kcmil 26/7	Order by			HR-556-267A	
795 kcmil 26.7	conductor size				
954 kcmil 54/7	and stranding				

cy-1.1  
July 1987

cy - Splice, Compression

ACSR

<u>Conductor Size</u>	<u>Nat. Tel. Supply</u>	<u>Homac</u>	<u>ESP</u>
4 6/1	"Nicopress"	"Tension splicer"	FTR-4
4 7/1	(1-pc. or 2-pc.)	(1-piece or	FTR-4
2 6/1	Order by Conduc-	2-piece	FTR-2
2 7/1	tor Size and	Order by	FTR-2.5
1/0	Stranding	Conductor	FTR-1/0
2/0	2-pc.	Size and	FTR-2/0.5
3/0	"	Stranding	FTR-3/0
4/0	"	2-pc.	FTR-4/0
266.8 kcmil 26/7	"	"	
336.4 kcmil 26/7	"	"	
477 kcmil 26/7	"	"	
556.5 kcmil 26/7	"	"	
795 kcmil 26/7			
954 kcmil 54/7			

cy-2  
July 1987

Splice, Compression

Copper and Copperweld-Copper

<u>Conductor Size</u>	<u>Anderson/Sq. D</u>	<u>Burndy</u>	<u>Kearney</u>	<u>National Tel. Supply</u>
6 cu	VCC-28	YDS6W	OH6C	1-162/J
4 cu	VCC-28	YDS4W	OH4C	1-204/P
2 x 3 cu	-	YDS2C-3	OH2-3CX	1-258/3X
0 x 7 cu	-	YDS25	OH1-7C	1-325/7F6
8A CWC	VCC-28	YDS8KT	OHR8ACH	1-8A-P
6A CWC	VCC-28	YDS6KT	OHR6ACH	1-6A-P
4A CWC	VCC-37	YDS4KT	OHR4ACH	1-4A-X
2A CWC	VCC-43	-	-	-

Conductor Size      Homac

6 cu	J2C3
4 cu	L2C5
2 x 3 cu	S2C7
0 x 7 cu	U2C9
8A CWC	L2E1
6A CWC	L2E3
4A CWC	Q2E5
2A CWC	U2E7

cy-3  
July 1987

cy - Splice, compression  
(one-piece)

(For 6201 and 5005 Aluminum Alloy Conductors)

<u>Conductor Size</u>	<u>Anderson/Square D</u>	<u>Burndy</u>	<u>Blackburn</u>
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#4 thru 4/0	Type VC-R Order by Conductor Size and Stranding	"Unsplice" Order by Conductor Size and Stranding	Type RC Order by Conductor Size and Stranding
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<u>Conductor Size</u>	<u>Homac</u>	<u>ESP</u>
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#4 thru 4/0	"Tension Splicer Order by Conductor Size and Stranding	Type FTR order by size and stranding
-------------	--	--

Conditional List  
cy  
July 1987

cy - Splice, compression

1-piece splice for ACSR

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
*ALCOA "Jiffy Joint"	704 (11/10/60)	To obtain experience.

1-piece splice for AWAC

Burndy		
AWAC 4-4/3	1050 (9/19/74)	To obtain experience.
YDS7M10T		
AWAC 2-4/3		
YDS7M9T		
AWAC 1/0-4/3		
YDS7M7T		

\*Satisfactory for use with 6201 and 5005 all aluminum alloy conductor through 4/0 and 19 strand conductors of sizes 266,800 CM and 477,000 CM.

## cz - Splice for Steel Strand (Overhead Ground Wire)

Compression

	<u>High Strength Steel</u> <u>3/8"</u> <u>7/16"</u>	<u>Extra High Strength</u> <u>5/16"</u> <u>7/16"</u>	<u>Aluminum Clad Steel</u> <u>7 No. 9 AWG</u> <u>7 No. 8 AWG</u> <u>7 No. 7 AWG</u>
Alcoa		4914.386	4916.453
Burnby	YTS375E	YTS438E	YDS7M9T
Fargo	811425	811630	811425
Homac	29714		811427
Kearney	HR-3/8-3-7S		
National. Tel. Supply	5-7/120692	5-7/145J22	

Steel and Aluminum Sleeves

Homac	29714 & 28414 (Two piece)	<u>Automatic</u>	5042	5043
Reliable	5043	<u>Bolted Type</u>	5044	5045
Electroline	GO-537	<u>formed Type</u>		
Helical Line Products	HS-310-3/8"	HS-311-7/16"		

da  
July 1987

da - Bracket, insulated

	<u>Bracket without Insulator</u>	<u>Bracket with 1-3/4" Spool Insulator</u>	<u>Bracket with 3" Spool Insulator</u>
Chance	0327	0327-C909-1032	0327-C909-1034
Dixie	D0327	-	-
Joslyn	J1300	J1301	J1303
Kortick	K9278	K9081	K9082
McGraw-Edison	DC2C1	-	-
Hughes Brothers	1077LI	1077SI	1077I

dh  
July 1987

dh - Ground, pole

(For system grounds see ground rods on page ai.)

<u>Manufacturer</u>	<u>Catalog Number</u>
---------------------	-----------------------

Galvanized Steel Plate With Insulated  
Copper Lead

(For connecting to a copper or aluminum  
ground wire above ground.)

Joslyn Power Line Hardware	J055W PGPS-56CL8
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Galvanized Steel Plate with Connector  
(For connecting to a galvanized iron ground wire)

Joslyn	J055
McGraw-Edison	DN13M1
Power Line Hardware	PGPS-56C

Copper Plate

Blackburn	GP-100
Drabco	D 101
Homac	5575
Power Line Hardware	PGPC-56
Weaver	PBH

d1  
July 1987

d1 - Pipe Spacer

3/4" diameter x 1-1/2" length

<u>Manufacturer</u>	<u>Catalog Number</u>
Chance	2237
Dixie	D2031
Joslyn	J2031
McGraw-Edison	DM3P2
Utilities Service	36695

dm  
July 1987

dm - Bracket, transformer  
(For cluster mounting of two or three transformers on pole)

<u>Manufacturer</u>	<u>Transformer Size, kVA</u>	<u>Band Type</u>	<u>Through Bolt Type</u>
Aluma-Form	3-50	6M3-6	3MW-24
	75-100	15M3-6	12MW-24
Chance	3-25	215, 315	
	3-50		C212-0142
	37-1/2-50	250, 350	
	75-100	3100	C212-0146
Dixie	3-25*		D0565
	37-1/2-50		
	75-100		D-0561-CP
Hughes	3-25*		3021
	37-1/2-50		3020
	75-100		3020 with adapter plates and back plate.
Joslyn	3-25*	24352, 24353 with adapter plate	
		24524	J6865
	37-1/2-50	24352, 24353 (two needed)	J6864
	75-100	24352, 24353 (two needed)	J6866
McGraw-Edison	3-25*	DT6C2	DT6C1
	37-1/2-50	DT7C2	DT7C1
	75-100	DT8C2	DT8C1
Turner	3-25*		305-25
	37-1/2-50		305-100
	75-100		305-100

\*These brackets will accomodate 25 kVA transformers which are made with a 12-inch spacing between support lugs. Those 25 kVA transformers having a 23-1/4-inch spacing between lugs will require the bracket listed for 37-1/2-50 kVA.

For mounting of two transformers

Aluma-Form	3-100	DM-4M2
	3-50	DM-2M2
Chance	3-100	C212-0001
Hughes	3-50	3022
Turner	3-50	205-25

dp  
July 1987

dp - Clamp, ground wire

Transmission

For grounding steel towers and substation structures

Bolt Included

(For use with copper ground wires)

<u>Manufacturer</u>	<u>Catalog Number</u>
Penn-Union	GH-30-C-A1
ITT Royal	12202-T (Type LCS)
UTM	910-027-01

For use in: Pole Grounding Assembly TM-9  
Capacitor Assemblies M9-11, M9-12 and M9-13

<u>Manufacturer</u>	<u>For 5/8" Bolt</u>	<u>For 3/4" Bolt</u>
Continental	SBL-33	-
Dixie	D-5452	-
Flagg (MIF)	PA-166A	-
Joslyn	J1163	J1164
McGraw-Edison	DG1C5	DG1C6

<sup>dq</sup>  
July 1987

dq - Eye Screw, Elliptical

For use in deadending triplex type service cable, Drawing K10C.

<u>Manufacturer</u>	<u>Catalog Number</u>
Joslyn	J8930
McGraw-Edison	DF7E6

dr  
July 1987

dr - Clevis, conduit, insulated

For use in deadending triplex service cable, Drawing K16C.  
Applicable Specifications: "REA Specifications for Insulated  
Conduit Clevises and Conduit Wire-  
holders for Pipe Mast Deadends," D-16

Joslyn J0311\*

McGraw-Edison DW8M1\*

\*Insulator not included. See page cm for spool insulator.

ds  
July 1987

ds - Wireholder, conduit

For use in deadending open wire services on pipe masts, Drawing K17

Applicable Specifications: "REA Specifications for Insulated Conduit Clevises and Conduit Wireholders," D-16

<u>Manufacturer</u>	<u>Catalog Number</u>
Chance	C207-0075
Dixie	D-4010
Joslyn	J0588
McGraw-Edison	DW2C3

dt  
July 1987

dt - Deadend, service

For deadending triplex type service cable, Drawing K10C.

<u>Manufacturer</u>	<u>ACSR Size</u>	<u>Catalog Number</u>	
		<u>Wedge Type</u>	<u>Formed Type</u>
Blackburn	4	H6-4AA	-
	2	H6-2AA	-
	1/0	H2-0AA	-
Burndy	4	CH2R-1	-
Chance	4	-	CSG-030
	2	-	CSG-050
	1/0	-	CSG-070
Helical Line Products	4	-	HSG-514
	2	-	HSG-518
	1/0	-	HSG-522
Joslyn	4 & 2	R7295	-
	1/0	R7287	-
Penn-Union	4 & 2	WDC-2S	-
	1/0	WDC-10S	-
Preformed Line Products	4	-	SG-4502
	2	-	SG-4504
	1/0	-	SG-4506
Reliable	4 & 2	7295	-
	1/0	7287	-

du  
July 1987

du - Link, Extension

DISTRIBUTION

<u>Manufacturer</u>	<u>Catalog Number</u>
Bethea Electrical	LCE-14
Bethea Metals	ACL-14-5
Chance	C207-0112
Continental	CEL-14
Flagg (MIF)	PA319
McGraw-Edison	DC33B6
Utilities Service	495

TRANSMISSION

(25,000 lbs. min. strength)

Bethea Electrical Products	ASM 7209-1-BC
Joslyn	J26082

Guy Extension Link  
(For "H" Structure)

<u>Manufacturer</u>	<u>One Guy Attachment</u>	<u>Two Guy Attachment</u>
Joslyn	J22421	J26025

NOTE: The distribution extension links may be substituted for anchor shackle (Item bo), eye bolt (Item o) and eye nut (Item aa) for both small and large conductor drawings shown in REA Form 803 and REA Bulletin 50-3 at the option of the owner.

Conditional List

du(1)

July 1987

du - Connecting Links

Conditions: To obtain experience in conjunction with pole bands [Item fv(1)]  
Strength Rating: 25,000 lbs. ultimate loading.

<u>Manufacturer</u>	<u>Link to guy</u>	<u>Size</u>	<u>Meeting No. and Date</u>
Hughes	3154	3/8" x 2" x 9-1/2"	1172 9/20/79
	Link to <u>Insulators</u>		
Hughes	3176	3/8" x 3" x 9-1/2"	1172 9/20/79
	<u>Link to guy</u>		
Joslyn	J26033	3/8" x 2" x 9-1/2"	1292 1/10/85
	Link to <u>Insulators</u>		
Joslyn	J26034	3/8" x 3" x 9-1/2"	1292 1/10/85

dy  
July 1987

dy - Bolt, eye, double arming

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes : 5/8 inch, 14 through 26 inch length  
3/4 inch, 14 through 26 inch length

The following manufacturers have shown compliance with the applicable specifications:

A. B. Chance Company  
Dixie Electrical Manufacturing Company  
Joslyn Manufacturing and Supply Company  
Kortick Manufacturing Company  
\*McGraw-Edison  
Utilities Service Company

\*"Static proof" designs available.



dz  
July 1987

dz - Clip, Guy Wire

<u>Manufacturer</u>	<u>5/16"</u>	<u>3/8"</u>	<u>7/16"</u>	<u>1/2"</u>
Chance	6453	6454	6455	6456
McGraw-Edison	DJ17C6	DJ17C8	DJ17C10	DJ17C12
Utilities Service	4953	4954	4955	4956

ea-1  
July 1987

ea - Insulator and Stud, post type

DISTRIBUTION

System voltage, kV	12.5/7.2*	12.5/7.2*	24.9/14.4**
Leakage, inches	7-1/2	10	15
Flashover, dry, kV	65	70	95
Flashover, wet, kV	40	50	65

Chance

7" Stud	C903-1910-04	C903-1911-04	C903-1912-04
1-3/4" Stud	C903-1910-05	C903-1911-05	C903-1912-05

Lapp

7" Stud	4415P	4420P	4427P
1-3/4" Stud	4315P	4320P	4327P

Ohio Brass

7" Stud		43400-7040	43401-7040
1-3/4" Stud		43400-7010	43401-7010

Porcelain Products (Knox)

7" Stud	5115-6510	5120-6510	5127-6510
1-3/4" Stud	5115-6500	5120-6500	5127-6500

TRANSMISSION

System voltage, kV	22	34.5	46
ANSI Class	57-2	57-3	57-4
Flashover, dry, kV	110	125	150
Flashover, wet, kV	85	100	125

Chance

7" Stud	C903-1002-04	C903-1003-04
1-3/4" Stud	C903-1002-05	C903-1003-05

Lapp

7" Stud	9435	9445	9455
1-3/4" Stud	9335	9345	9355

Ohio Brass

7" Stud	37620-7040	41640-7040	41650-7040
1-3/4" Stud	37620-7010	41640-7010	41650-7010

Porcelain Products (Knox)

7" Stud	5135-6512	5145-6512
1-3/4" Stud	5135-6502	5145-6502

NOTE: Post Insulators (item ea) may be substituted for the crossarm pin (Item f) and pin insulator (Item a) for both small and large conductor distribution drawings shown in REA Form 803 at the option of the owner.

\*The transverse loading on these insulators shall not exceed the lower of 40 percent of the insulator's ultimate strength and the maximum transverse loading given for the structure in REA Bulletin 50-3.

\*\*The transverse loading on these insulators shall not exceed 40% of the insulations' ultimate strength.

ea-2  
July 1987

ea - Insulators, horizontal post type

<u>Manufacturer</u>	<u>34.5 kV</u>	<u>69 kV</u>	<u>115 kV</u>
Lapp	F-4745	F-4788	F-70147
Locke	-	LS02513	LS05013
Ohio Brass	43740	43790	47043
Victor Insulators, Inc.	62356	-	-

Conditional List  
ea(1)  
July 1987

ea - Insulator, post type

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Victor Insulators, Inc.</u>		
2120 (12.5/7.2 kV)	932	To obtain experience.
2127 (24.9/14.4 kV)	12/4/69	
62055 (22 kV)	1189	
62056 (34.5 kV)	6/19/80	

eb  
July 1987

eb - Bracket, Pole Top  
For Post type Insulators

DISTRIBUTION

<u>Barron Bethea</u> (14.4 or 7.2 kV)	1B-4
<u>Bethea Electrical</u> (14.4 or 7.2 kV)	BPT-58F
<u>Continental</u> (14.4 or 7.2 kV)	PTB-55-8
<u>Flagg (MIF)</u> (14.4 or 7.2 kV)	P526
<u>Joslyn</u> (14.4 or 7.2 kV)	J23333
<u>Lapp (Line Ware)</u> (14.4 or 7.2 kV)	304043
<u>McGraw-Edison</u> (14.4 or 7.2 kV)	DC62B1
<u>Power Line Hardware</u> (14.4 or 7.2 kV)	PTIB-375A
<u>Universal Electric</u> (14.4 or 7.2 kV)	PT-8R

TRANSMISSION

<u>Barron Bethea</u>	1B-4
<u>Bethea Electrical</u>	BPT-58HF
<u>Continental</u>	PTB-66H
<u>Flagg (MIF)</u>	P532
<u>Lapp (Line Ware)</u>	304044
<u>McGraw-Edison</u>	DP29A1

NOTE: Pole top bracket (Item eb) and post insulator (Item ea) may be substituted for pole top pin (Item b) and pin insulator (Item a) for both small and large conductor distribution drawings shown in REA Form 803 at the option of the owner.

<sup>ec</sup>  
July 1987

ec - Bracket, Offset Neutral

Chance	C206-0004
Dixie	D-2353
Joslyn	J2352
McGraw-Edison	DC6N1

*ed*  
July 1987

**ed - Support, overhead ground wire**

**Applicable Specifications: "REA Specifications for Overhead Ground  
Wire Support Brackets," T-2**

Pole top diameter, inches	6-8	8-10	10-12
Chance	-	5432	5433
Dixie	-	-	07760
Hughes Brothers	-	2859-12	2859-14
Joslyn	J6393	J6394	J6395
Kortick	K3580	K3581	K3582
Utilities Service	C1238	C1239	C1240

ef  
July 1987

ef - Bolt, clevis

Applicable Specifications: "REA Specifications for Clevis Bolts,"  
DT-7

	Dia. <u>Inches</u>	<u>8"</u>	<u>10"</u>	<u>12"</u>	<u>14"</u>
Chance	5/8	15808	15810	15812	15814
	3/4	15828	15830	15832	15834
Joslyn	5/8	J7808	J7810	J7812	J7814
	3/4	J7828	J7830	J7832	J7834



eg  
July 1987

eg - Plate, crossarm reinforcing

TRANSMISSION

For 5-5/8" x 7-3/8" crossarm

<u>Manufacturer</u>	<u>Catalog Number</u>
Chance	4047
Hughes Brothers	1113.88
Joslyn	J22672.6
Utilities Service	3838

<sup>eh</sup>  
July 1987

eh - Hook, ball

<u>Manufacturer</u>	<u>Catalog Number</u>
Anderson Elec./Square D	HB-30
Bethea Electrical	BH-5
Continental Electric Co.	BH-30-5
Flagg	13400
Joslyn (Brewer-Titchener)	3001-HT
Lapp	7055
Lindsey	3310
Power Line Hardware	BH-30

er  
July 1987

ei - Clamps, suspension with socket eye

ACSE with Straight or formed Arrest Rods

	AISI			AISI			kcmil				
	1/0	4	2/0	3/0	4/0	266.8	336.4	477	556.5	795	954
<u>Iron or Steel Clevises</u>											
Anderson	MS-82-S	—	MS-104-S	MS-104-S	—	—	—	—	—	—	—
Barron Bethea	FCH-4S	—	—	—	—	—	—	—	—	—	—
Bethea Electrical	FS-83-S	—	—	—	—	—	—	—	—	—	—
Joslyn	6203	6204	6204	6205	6255	6257	—	—	—	—	—
(Brewer Titchener)	305743S	—	—	—	—	—	—	—	—	—	—
Lapp	—	—	—	—	—	—	—	—	—	—	—
<u>ACSE with Straight or formed Arrest Rods</u>											
	1/0	4	2/0	3/0	4/0	266.8	336.4	477	556.5	795	954

	AISI			Aluminum Alloy Class			kcmil				
	1/0	4	2/0	3/0	4/0	266.8	336.4	477	556.5	795	954
<u>Iron or Steel Clevises</u>											
Anderson	HAS-85-S	HAS-104-S	HAS-104-S	HAS-110-S	HAS-139-S	HAS-147-S	HAS-182-S	HAS-182-S	HAS-182-S	LS-7-S	LS-8-S
	LS-1-S	LS-2-S	LS-2-S	LS-3-S	LS-4-S	LS-6-S	LS-7-S	LS-7-S	LS-7-S	—	—
Bethaea	CRSC-1S	CRSC-2S	CRSC-3S	CRSC-3S	—	—	AGS	AGS	AGS	AGS	AGS
C & R	—	AGS	AGS	AGS	AGS	AGS	SC-136-S	SC-149-S	SC-177-S	SC-192-S	—
Dulmison	SC-85-S	SC-105-S	SC-105-S	SC-119-S	9504-S	9505-S	9506-S	—	—	—	—
Continental	9503-S	9504-S	306030S	306031S	306030S	306031S	306032S	AGS	AGS	AGS	AGS
Joslyn (Brewer Titchener)	306029S	—	AGS	AGS	AGS	AGS	AGS	AGS	AGS	AGS	AGS
Lapp	—	—	—	—	—	—	—	—	—	—	—
prefomed	—	—	—	—	—	—	—	—	—	—	—

\*Clevis type available.

e.i  
July 1987

**ej - Clamps, deadend with socket eye**

	AHG	ACSR			kcmi]		
2/0 to 4/0	266.8	336.4	477	556.5	795	954	
<u>Iron or Steel Clamps (require armor tape or liner)</u>							
Joslyn (Brewer-Titchener)	5001	5002	5002	5003	--	--	--
<u>Aluminum Alloy Clamps (do not require armor tape or liner)</u>							
Anderson/Square D	SD-57-S	SD-70-S	SD-86-S	SD-86-S	SD-98S	--	--
Bethlea Electrical	ADE-21-S	ADE-22-S	ADE-23-S	ADE-24-S	ADE-24-S	ADE-2526-S	ADE-2526-S
C & R	CR-10-60S	CR-20-60S	CR-20-60S	--	--	--	--
Joslyn (Brewer Titchener)	5200	5201	5202	5203	--	--	--
Lapp	305757S	305758S	305759S	305760S	--	--	--

**NOTE:** When used with clevis-type insulators for large conductors on distribution lines, order clamp with clevis eye.

ek  
July 1987

ek - Locknuts

For Bolt Diam., in.:	3/8	1/2	5/8	3/4	7/8
<u>MF Type</u>					
Chance	3510	3511	3512	3513	3514
Dixie	D3510	D3511	D3512	D3513	--
Hughes Brothers	MF30	MF50	MF60	MF70	--
Joslyn	J8581	J8582	J8583	J8584	J8584-1/2
Kortick	K1065	K1066	K1067	K1068	--
McGraw-Edison	DF3N1	DF3N2	DF3N4	DF3N6	DF3N8
Power Line Hardware	SLN38	SLN50	SLN58	SLN34	SLN78
Utilities Service	4920	4921	4922	4923	4924

e1  
July 1987

7/3 e1 - Sectionalizer

Manufacturer

McGraw-Edison (Kyle)

Type

GH (with crossarm mounting  
bracket KA27G)

## Conditional List

el

July 1987

## el - Sectionalizer

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>McGraw-Edison</u>		
Sectionalizer, three-phase Type GN3	663 (3/12/59)	To obtain experience.
Sectionalizer with 125 kV BIL accessory Type GH, 15 kV, single phase	1046 (7/25/74)	1. To obtain experience.
		2. For use on single- phase taps of 24.9/14.4 kV multi- grounded wye systems.
*Sectionalizer, three-phase Type GN3E 14.4 kV, 200 amp max.	1153 (12/21/78)	To obtain experience.
*Sectionalizer, three-phase Types GV and GVC 14.4 kV, 400 amp. max.	1153 (12/21/78)	To obtain experience.
*Sectionalizer, three-phase Types GW and GWC 34.5 kV, 400 amp. max.	1153 (12/21/78)	To obtain experience.
<u>General Electric</u>		
Sectionalizer, single-phase dry-type - 15 kV Model 9F41D with load interrupter only	910 (1/23/69) 1159 (3/15/79) 1278 (4/12/84)	1. To obtain experience. 2. Accepted ratings; 10 through 100 amperes at 15 kV max. line to ground voltage.
<u>Joslyn</u>		
Sectionalizer, three-phase, 15 kV, 400 and 600 amperes Model VBM with VT or RS control	1042 (5/30/74)	To obtain experience

\*NOTE: Ratings greater than 100 ampere for 12.5/7.2 kV application and greater than 200 ampere for 24.9/14.4 kV application are acceptable only with ground trip device.

em  
July 1987

em - Brace, crossarm, special  
(angle alley arm)

DISTRIBUTION

15" span, 14" drop; 1-1/2" x 3/16"

Dixie	D17939
Joslyn	J1415
Kortick	K1978
McGraw-Edison	DB4L1
Utilities Service	5514

TRANSMISSION

2'-6" span x 1'-8" drop  
1-3/4" x 3/16"

3'-6" span x 2'-3" drop  
1-3/4" x 3/16"

Chance	--	6999
Hughes Brothers	AS-2309-B	AS-2309-A
Joslyn	J1430	J1442
Kortick	K1975	K1976
McGraw-Edison	DB4L3	DB4L4
Utilities Service	5509	5510

Conditional List

eq(1)

July 1987

eq - Narrow Profile Brackets and Special Arm Assemblies  
(See REA Bulletin 61-12)

METAL BRACKETS

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
---------------------	---------------------------------	-------------------

<u>Chance</u>		
Single post insulator brackets	1049 9/5/74	1. To obtain experience.
C206-0209 for 12.5/7.2 kV construction only		2. For use only in scenic areas and locations where right-of-way is limited.
C206-0010 for 24.9/14.4 kV construction		3. Not to be used where conductor galloping may be expected.
Deadend bracket assembly, C206-0179	1081 1/8/76	
Deadend bracket assembly, C206-0211 for 24.9/14.4 kV construction		
<u>Continental</u>		
Standoff bracket IACB-18-5	1065 5/15/75	(Same as above)
<u>Flagg (MIF)</u>		
Single post insulator bracket, P542	1032 12/20/73	(Same as above)
Deadend bracket assembly, PAX188A		
Deadend bracket assembly, PAX188M for 24.9/14.4 kV construction	1044 6/27/74	
Standoff bracket, PA619B	1048 8/22/74 1335 2/5/87	
<u>Joslyn</u>		
Single post insulator brackets	1043 6/13/74	(Same as above)
24840.1, for 12.5/7.2 kV construction only		
24840.2, for 24.9/14.4 kV construction		

Conditional List  
eq(1.1)  
July 1987

eq - Narrow Profile Brackets and Special Arm Assemblies  
(See REA Bulletin 61-12)

METAL BRACKETS

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Anderson/Sq. D</u> Standoff bracket, COB-E-180-TGL	1180 (1/31/80)	1. To obtain experience 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected.
<u>Bethea Electrical</u> Single post insulator bracket, HBF-10-9-GC Standoff bracket VIB3-18-GC	1156 (2/1/79) 1213 (6/4/81) 1278 (4/12/84)	Same as above.
<u>Dixie</u> Deadend bracket assembly D21142 for 12.5/7.2 kV	1220 (10/8/81)	Same as above.
Deadend bracket assembly D21144 for 24.9/14.4 kV		
<u>Universal Electric</u> Single post insulator bracket, SAB-3-18-GC	1271 (12/15/83)	Same as above.
<u>Western Power Products</u> Single post insulator bracket, HDB-200-R, for 12.5/7.2 kV construction only.	1152 (12/7/78)	Same as above.

Conditional List  
eq(2)  
July 1987

eq - Narrow Profile Brackets and Special Arm Assemblies  
(See REA Bulletin 61-12)

FIBERGLASS REINFORCED PLASTIC

For 12.5/7.2 kV

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Hughes Brothers</u>		
Two-phase angle bracket 761-36-8	1032 (12/20/73)	1. To obtain experience.
Two-phase pin bracket 813-36	1294 (2/14/85)	2. For use only in scenic areas and locations where right-of-way is limited.
Standoff insulator, 560-13		
Standoff insulator, 560-18		
Suspension bracket, 615-18		
Deadend arm, 540-36	1063(4/17/75)	3. Not to be used where conductor galloping may be expected.
Standoff bracket, 892-18	1089(4/29/76)	4. Not to be used in contaminated atmospheres.
<u>Chance</u>		
Two-phase pin bracket C653-0638	1043(6/13/74)	Same as above
Standoff insulator C653-0621		
Deadend arm C653-1023	1049(9/5/74) 1141(6/15/78)	
<u>Continental</u>		
Two-phase pin bracket GPB2-568M-36V	1181(2/14/80)	Same as above.
Two-phase angle bracket GPB2-568M-36E		
Standoff insulator GPB-58M-13		
Standoff insulator GPB-58M-18		
Deadend arm GDEA-58-3.0-36-2E		
Suspension bracket GPB-58M-18E		

Conditional List  
eq(2.1)  
July 1987

eq - Narrow Profile Brackets and Special Arm Assemblies  
(See REA Bulletin 61-12)

FIBERGLASS REINFORCED PLASTIC  
For 12.5/7.2 kV

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Bethea Electrical		
Two-phase pin bracket 6742-36P	1285 8/16/84	1. To obtain experience
Standoff insulator bracket 6745-13P		2. For use only in scenic areas and locations where right-of-way is limited.
Standoff insulator bracket 6745-18P		3. Not to be used where conductor galloping may be expected.
		4. Not to be used in contaminated atmospheres.

Flagg (MIF)

Two phase angle bracket 7561-336E	1201 12/4/80	Same as above.
Two phase pin bracket 7561-436		
Standoff insulator 7561-012		
Standoff insulator 7561-018		
Suspension bracket 7561-818		
Standoff bracket 7561-218		
Deadend arm 7554-636-4E	1272 1/5/84	

Conditional List  
eq(2.2)  
July 1987

eq - Narrow Profile Brackets and Special Arm Assemblies  
(See REA Bulletin 61-12)

FIBERGLASS REINFORCED PLASTIC

For 24.9/14.4 kV

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Chance</u> Two-phase pin bracket C653-0987	1049(9/5/74)	1. To obtain experience.
Standoff insulator C653-0988		2. For use only in scenic areas and locations where right-of-way is limited.
Deadend arm C653-1024	1041(6/15/78)	3. Not to be used where conductor galloping may be expected.
		4. Not to be used in contaminated atmospheres.
<u>Continental</u> Two-phase pin bracket GPB2-568M-44--V-1.375	1181(2/14/80)	Same as above.
Two-phase pin bracket GPB2-558H-48-V-1.375	1272(1/5/84)	
Standoff insulator GPB-58M-19-V-1.375		
Standoff insulator GPB-58H-20-V-1.375		
Standoff bracket GIACB-58M-18		
Deadend arm GDEA-58-3.0-48-2E		
<u>Hughes Brothers</u>		
Deadend arm, 540-48	1063 (4/17/75)	Same as above.
Standoff insulator, 880-20	1081 (1/8/76)	
Two-phase pin bracket, 883-48	1089 (4/29/76)	
Standoff insulator, 870-19	1294 (2/14/85)	
Two-phase pin bracket, 862-44		
Standoff bracket, 892-18		

Conditional List  
eq(2.3)  
July 1987

eq - Narrow Profile Brackets and Special Arm Assemblies  
(See REA Bulletin 61-12)

FIBERGLASS REINFORCED PLASTIC

For 24.9/14.4 KV

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Bethea Electrical Products</u>		
Standoff insulator bracket 6882-18P	1285 8/16/84	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited.
Standoff Insulator Bracket 6744-19P-1.375	1307 10/10/85	3. Not to be used where conductor galloping may be expected.
Standoff insulator bracket 6748-20P-1.375		4. Not to be used in contaminated atmospheres.
Two-phase pin bracket 6742-44P-1.375		
Two-phase pin bracket 6747-48P-1.375		

Flagg (MIF)

Standoff insulator 7581-120X	1201 12/4/80	Same as above.
Standoff insulator 7561-118X		
Two-phase pin bracket 7561-448X	1272 1/5/84	
Standoff bracket 7561-218		
Deadend arm 7554-648-4E		

Conditional List  
eq(3)  
July 1987

eq - Narrow Profile Brackets and Special Arm Assemblies  
(See REA Bulletin 61-12)

WOOD ARM ASSEMBLIES

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Aluma-Form</u> Arm assembly, 12.5/7.2 kV XA-3812	1038 (4/4/74)	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited.
Arm assembly, 24.9/14.4 kV XA-4214		3. Not to be used where conductor galloping may be expected. 4. Not to be used as deadend structures.
<u>Hughes Brothers</u> Deadend arm, 2890-J complete with braces and attaching hardware, fittings and bolts	1065 (5/15/75)	1. To obtain experience. 2. For use only in scenic areas and locations right-of-way is limited. 3. Not to be used where conductor galloping may be expected.

Conditional List  
eq(4)  
July 1987

eq - Narrow Profile Brackets and Special Arm Assemblies  
(See REA Bulletin 61-12)

COMBINATION INSULATORS AND BRACKETS

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Salisbury Horizontal Post 12.5/7.2 kV, 9561 24.9/14.5 kV, 9562	1305 (8/22/85)	<ol style="list-style-type: none"><li>1. To obtain experience.</li><li>2. For use only in scenic areas and locations where right-of-way is limited.</li><li>3. Not to be used where conductor galloping may be expected.</li><li>4. Not to be used in contaminated atmospheres.</li></ol>

er  
July 1987

er - Wire Guard, Plastic

See Drawing M-24

Manufacturer

Type or  
Catalog Number

Chance

PFG

Fargo

GM-936

Preformed Line Products (Tree Guard)

PTG

es  
July 1987

es - Splice Cover, Plastic

(For use over compression type service connections  
in place of tape.)

<u>Manufacturer</u>	<u>Type</u>
Anderson/Square D	Type SEC
Blackburn	Type C
Kearney	Type 601
3M	PST Series 8400
Plastic Engineering & Sales Co.	Wire Splice Cover
Virginia Plastics	Type VP

Splice Cover and Moisture Seal for  
Secondary Cable Connections (See  
Drawings G312 and UM5)

<u>Manufacturer</u>	<u>Type</u>
AMP	Sealing & Dielectric Compound
Bishop	Electro-Seal
3M	Scotch Brand #2200

Bolted Connector Cover

(For use over bolted type service connections in place of tape.)

<u>Manufacturer</u>	<u>Type</u>
Fargo	GA-9000 B Series

eu  
July 1987

eu - Extension Link  
(Fiberglass)  
(Distribution)

<u>Manufacturer</u>	<u>Strength</u>	<u>Catalog Number</u>
Anderson/Square D	10,000 lbs.	*GSB1-9
	15,000 lbs.	GSB2-12
Barron Bethea	11,000 lbs.	*BB-11-EE-12
	15,000 lbs.	BB-15-EE-12
Bethea Electrical Products	11,000 lbs.	FGS16-EE-12P
	15,000 lbs.	FGS16-EE-12P
Continental	11,000 lbs.	*GEE11-12
	15,000 lbs.	GEE15-12
Flagg (MIF)	11,000 lbs.	150-12EE
	15,000 lbs.	150-12EE
Joslyn-Empire	15,000 lbs.	500-12EE
Tranpol	11,000 lbs.	*HSB-1-12
	15,000 lbs.	HSB-2X-12

\*For use with 6" suspension insulators.

Conditional List  
ex  
July 1987

ex - Splice, formed type

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Preformed Line Products</u> Splice for ACSR FTS full tension splice	654 (10/16/58)	To obtain experience.
Splice for AWAC LS-0185 for 4-4/3 LS-0188 for 2-4/3 LS-0191 for 1/0-4/3	999 (8/31/72)	For repair only.  To obtain experience.  For repair only where alumoweld strands are not broken

fc-1  
July 1987

fc - Capacitors, Shunt  
12470/7200 Volts

<u>Manufacturer</u>	<u>Size</u>	<u>1 Bushing</u>	<u>2 Bushing</u>	<u>3 Bushing</u>
General Electric Film/Foil Type	25 kvar	52L226RC	52L206RC	
	50 kvar	51L226RC	51L206RC	
	100 kvar	54L226RC	54L206RC	
	150 kvar	54L526RC	54L506RC	
	200 kvar	58L126RC	58L106RC	
	300 kvar	59L226RC	59L206RC	59L611RC
Westinghouse	50 kvar	1N02050A09	1N02050A10	
	100 kvar	1N02100A09	1N02100A10	
	150 kvar	1N02150A09	1N02150A10	1N02150A07
	200 kvar	1N02200A09	1N02200A10	
	300 kvar			1N02303A07
	400 kvar			1N02403A07

fc-2  
July 1987

fc - Capacitors, Shunt  
24900/14400 Volts

<u>Manufacturer</u>	<u>Size</u>	<u>1 Bushing</u>	<u>2 Bushing</u>	<u>3 Bushing</u>
General Electric Film/Foil Type	50 kvar	51L252RC		
	100 kvar	54L252RC		
	150 kvar	54L552RC		
	200 kvar	58L154RC		
Westinghouse	50 kvar	1N02050A31		
	100 kvar	1N02100A31		
	150 kvar	1N02150A31		
	200 kvar	1N02200A31		
	300 kvar			1N02303A29
	400 kvar			1N02403A29

Conditional List  
fc(1)  
July 1987

fc - Capacitors, shunt  
12470/7200 volts

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>McGraw-Edison</u>		
All film type, 1 bushing CEP131B6 (100 kvar)	1109 (3/3/77)	To obtain experience
CEP132B6 (150 kvar)	1186 (5/8/80)	
CEP140B6 (200 kvar)		
CEP160B6 (300 kvar)		
All film type, 2 bushing CEP131A6 (100 kvar)		
CEP132A6 (150 kvar)		
CEP140A6 (200 kvar)		
CEP160A6 (300 kvar)		
<u>Westinghouse</u>		
All-film type, 1 bushing IN03050A09 (50 kvar)	1211 (4/30/81)	To obtain experience
IN03100A09 (100 kvar)		
IN03150A09 (150 kvar)		
IN03200A09 (200 kvar)		
All-film type, 2 bushing IN03050A10 (50 kvar)		
IN03100A10 (100 kvar)		
IN03150A10 (150 kvar)		
IN03200A10 (200 kvar)		
All-film type, 3 bushing IN03303A07 (300 kvar)		
IN03403A07 (400 kvar)		

Conditional List  
fc(2)  
July 1987

fc - Capacitors, shunt  
24900/14400 volts

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>McGraw-Edison</u>		
All film type, 1 bushing CEP138B4 (100 kvar)	1109 (3/3/77)	To obtain experience
CEP137B4 (150 kvar)		
CEP142B4 (200 kvar)		
CEP162B4 (300 kvar)	1186 (5/8/80)	Same as above
<u>Westinghouse</u>		
All-film type, 1 bushing 1N03050A31 (50 kvar)	1211 (4/30/81)	Same as above
1N03100A31 (100 kvar)		
1N03150A31 (150 kvar)		
1N03200A31 (200 kvar)		
All-film type, 3 bushing 1N03303A29 (300 kvar)		
1N03403A29 (400 kvar)		
<u>General Electric</u>		
Film/Foil Type, 1 bushing 51L252RC (50 kvar)	1192 (8/7/80)	Same as above
54L252RC (100 kvar)		
54L552RC (150 kvar)		
58L154RC (200 kvar)		

fd  
July 1987

fd - Hangers, Capacitor

Crossarm Mounting

	<u>1 unit</u>	<u>2 units</u>	<u>3 or 4 units</u>
General Electric	39F41	39F53	39F54
McGraw-Edison	CH1A1	CH2A2	CH4A1
Westinghouse	85B397G01	791C644G01	791C644G02

Pole Mounting

	<u>Single Phase</u>	<u>Three Phase</u>	
		<u>In Line</u>	<u>Cluster</u>
Aluma-Form	CR-3* thru CR-6*	CR-3/4*	3-CR-3/4*
Joslyn	J6744, J6744A		
General Electric	39F83G1	39F86G1	
Westinghouse	AL30R (3 units) AL60R (6 units)	(10 units) AL30R AL60R AL90R (30 units) AL13W AL23W AL33W AL43W AL53W	(3 units) (6 units) (9 units) (1 unit) (2 units) (3 units) (4 units) (5 units)

\* Available with oil switch mounting bracket.

<sup>fg</sup>  
July 1987

fg - Crossarm Saddle

(3-3/4" x 4" with 1-1/4" x 1/4" flange)

Manufacturer

Lapp

Catalog Number

10369

fi  
July 1987

fi - Connectors, hot line

Over Armor Rods

<u>Manufacturer</u>	<u>Catalog Number or Series (Al to Al)</u>	<u>Catalog Number or Series (Al to Cu)</u>
Blackburn	PGH	-
Electrical Specialty	AHC-500	AHC-500 GP
Fargo	GA-100 Series	GA-100C Series

fj, fk, fl  
July 1987

fj - Bracket, extension

(For use in mounting oil circuit reclosers or sectionalizers)

See Drawing VM3-10A

	<u>Through Bolt</u> <u>Type</u>	<u>Band Type</u>
Aluma-Form	TBRSM-1, TB2M1-9*	RSM-1
Dixie	D-2359-M	
Joslyn	J2357M	
McGraw-Edison	DR2E3	

\*For mounting double lug reclosers.

fk - Bracket, oil circuit recloser or sectionalizer

(For cluster mounting of three oil circuit reclosers on pole)

Aluma-Form	RSM-3, 6M3-9*
*McGraw-Edison	DT8C1
Turner	695-3

\*Suitable for 14.4 and heavy duty 7.2 kV.

fl - Rack, primary metering

(For cluster mounting of primary metering equipment on pole)

Aluma-Form	PMM Series
Turner	3CT-PT

fm  
July 1987

fm - Bracket, Arrester and Pothead Extension

For Distribution Arrester and Cutout - Pole Mounting

<u>Manufacturer</u>		<u>Single Phase</u>	<u>Three Phase</u>
Aluma-Form		1HCA-18 Series	R3CA-48
American Connector Engineering		EMB-3-18-GC	
Anderson/ Square D	12.5/7.2 kV 24.9/14.4 kV	COB-E-120-TGL COB-E-180-TGL	
Bethea Electrical	12.5/7.2 kV 24.9/14.4 kV	VIB3-18-R1-GC-C VIB3-18-GC	
Bethea Metals	12.5/7.2 kV 24.9/14.4 kV	AV1B3-12 AV1B3-18	
Chance		C653-1038	C653-1056
Continental	12.5/7.2 kV 24.9/14.4	IACB-12-5LGE IACB-18-5LGE	GPB-3-0-568M-3012-CAT 12 GPB-3-0-568M-4017-CAT 12
Dixie	12.5/7.2 kV 24.9/14.4 kV	D-1580 D-1583	D27211-G
Flagg (MIF)	12.5/7.2 kV 24.9/14.4 kV	PA613B PA619B	
Hughes Brothers		892-18	670-40
Joslyn	12.5/7.2 kV 24.9/14.4 kV	J26190 J26191	
McGraw-Edison		DC34B3	
Power Line Hardware	12.5/7.2 kV	CA-12-3GL	
Universal Electric		SAB-3-18-GC	

For two distribution arresters in parallel or one  
arrester and cutout - crossarm mounted

<u>Manufacturer</u>	<u>Catalog No.</u>
McGraw-Edison	DM23B1

For Intermediate Arrester Mounting

<u>Manufacturer</u>	<u>Single Phase</u>	<u>Three Phase</u>
Aluma-Form	WBMA-1	R3CSA-48
Bethea Electrical	12.5/7.2 kV	VIB3-18-R1-GC-C

fn  
July 1987

fn - Bracket, Cutout Extension

<u>Manufacturer</u>		<u>Catalog Number</u>
Aluma-Form		1HCA-C-18
American Connector Engineering		EMB-3-18-GC
Anderson Elec./ Square D	12.5/7.2 kV 24.9/14.4 kV	COB-E-120-TGL COB-E-180-TGL
Bethea Electrical	12.5/7.2 kV 24.9/14.4 kV	VIB3-12F-GC VIB3-18-GC
Bethea Metals	12.5/7.2 kV 24.9/14.4 kV	AVIB3-12 AVIB3-18
Chance		C653-1038
Continental	12.5/7.2 kV 24.9/14.4 kV	IACB-12-5-LGE IACB-18-5-LGE
Flagg (MIF)	12.5/7.2 kV 24.9/14.4 kV	PA613B PA619B
Hughes Brothers		892-18
McGraw-Edison		DC34B1
Power Line Hardware	12.5/7.2 kV	CA-12-3GL
Universal Electric		SAB-3-18-GC

fo  
July 1987

fo - Bracket, Transformer Secondary, Insulated

<u>Manufacturer</u>	<u>Bracket Without Insulator</u>	<u>Bracket With 2-1/4" Diameter Spool Insulator</u>	<u>Bracket With 3-1/8" Diameter Spool Insulator</u>
Chance	-	9113S	9114S
Joslyn	-	J6765-A	J6765
McGraw-Edison	DT4M1	DT4M13	DT4M11
Utilities Service	865	865/208	865/205

Conditional List  
fq  
July 1987

fq - Laminated Upswept Arms

Applicable Specification: REA Specification DT-58  
Applicable Drawing: REA Drawing TUS-1

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Hughes Brothers</u>		
Types:		
C-4080A (5-1/8" width)	1095 (8/11/76)	1. To obtain experience
C-4080B (5-1/8" width)		
C-4113A (3-1/8" width)	1113 (4/28/77)	2. For use only in scenic and urban areas where right- of-way is limited.
C-4113B (3-1/8" width)		

fr  
July 1987

fr - Triplex Cable support Clamp  
(See Drawing M24)

Manufacturer

Flagg

Catalog Number

PA392

Conditional List  
fs  
July 1987

fs - Pole Bearing Plate

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Flagg (MIF) P325B	785 (2/20/64)	<ol style="list-style-type: none"><li>1. To obtain service and operating experience on cross-braced transmission structures.</li><li>2. For determining corrosion resistance.</li><li>3. For determining structure uplift capability of the pole under various soil and moisture conditions.</li></ol>
Continental PB-80-7	1114 (5/12/77)	(Same as above)
Bethea Electrical PBP-156-7	1070 (7/24/75) 1278 (4/12/84)	(Same as above)
Dixie D-6370-GR	1210 (4/16/81)	(Same as above)

fu  
July 1987

fu - Swinging angle bracket and guying plate  
(TRANSMISSION)

Manufacturer

Joslyn

Catalog Number

J22712.3 (Bracket and guy plate)  
J22714 (plate only)

<sup>fv</sup>  
July 1987

fv - Guying Attachments  
Transmission

Guying Tees

Manufacturer

Joslyn

Catalog Number

J21480-A

Pole Eye Plates

Bethea Electrical

PE6-77A

Continental

EPR-66S-12

Flagg (MIF)

PX37D

Conditional List

fv(1)

July 1987

fv - Guy Attachments  
Pole Bands with Through Bolts  
for Transmission Lines

Strength Ratings: 25,000 lbs. ultimate loading  
(45° guy angle)\*

<u>Manufacturer</u>	<u>Pole Band With Through Bolts and Associated Hardware**</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Hughes	3108 C.x	1172 9/20/79	To obtain experience.
		1292 1/10/85	
Joslyn	J26043.xGL (includes fetter drive lag screws and thru bolt)	1292 1/10/85	To obtain experience.

\*For a 30° guy angle, capacity of pole bands should be derated.

\*\*Appropriate connecting links (Item du(1)) should be ordered with the  
pole band.

9a - Watthour and Watthour-Demand Meters  
10. 2 and 3 wire or 2/3 wire 120/240 volts

<u>Self-Contained Types</u>	Type of Base	Watthour Meter Type	Mechanical Demand Watthour Type	Thermal Demand Watthour Type	Number of Terminals	
Manufacturer	1	2	3	4	5	6
Duncan	Bottom Con. Socket	- MS	- BMS-2S	- THS	-	-
General Electric	Bottom Con. Socket	150A 170S	IM50A IM70S	- -	4 4	4 4
Sangamo	Bottom Con. Socket	J5SA J5S	J5DSA J5DS	- -	-	-
Westinghouse	Bottom Con. Socket	D2A D5S	D2AM D5SM	D2SH	- 4	- 4
<u>Transformer Rated Types</u>						
Duncan	Bottom Con. Socket	- MS	- BMS	- THS	-	5 or 6
General Electric	Bottom Con. Socket	150A 170S	IM50A IM70S	- -	5 or 6 5 or 6	5 or 6 5 or 6
Sangamo	Bottom Con. Socket	J5SA J5S	J5DSA J5DS	- -	-	-
Westinghouse	Bottom Con. Socket	D2A D2S	D2AM D2SM	- -	5 or 6 5 or 6	5 or 6 5 or 6

**Polyphase 2 Element - 3 wire, 240 volts - Delta and 120/208 Volts Network**

Self-Contained Types Manufacturer	Type of Base 2	Watthour Meter Type 3	Mechanical Demand Watthour Type 4	Thermal Demand Watthour Type 5	Number of Terminals 6
			BMT-12S or 13S	TMT-12S	
Duncan	Bottom Con. Socket				
General Electric	Bottom Con. Socket	V62A V62S	V462A V462S	-	5 or 8
Sangamo	Bottom Con. Socket	S2A S2S S12S	S20A S20S S120S	-	5 or 8
Westinghouse	Bottom Con. Socket	- D555	- D555M	-	-

**Transformer Rated Types**

Duncan	Bottom Con. Socket	MT-5A MT-5S	BMT-5A BMT-5S	TMT-5A TMT-5S	8
General Electric	Bottom Con. Socket	V63A V63S	V463A V463S	-	8
Sangamo	Bottom Con. Socket	S3A S3S	S30A S40S	-	8
Westinghouse	Bottom Con. Socket	DSA2H D552H	DSA2H D552H	D4S-2H	8

ga - Watthour and Watthour-Demand Meters  
Polyphase 2 Element - 4 Wire Delta - 120/240 volts

<u>Self-Contained Types</u>	Type of Base	Watthour Meter Type	Mechanical Demand Watthour Type	Thermal Demand Watthour Type	Number of Terminals
<u>Manufacturer</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Duncan	Bottom Con. Socket	MI-15S	—	BMT-15S	—
General Electric	Bottom Con. Socket	V66A V66S	—	VH66A VH66S	7 —
Sangamo	Bottom Con. Socket	S6A S6S	—	S6DA S6DS	— 7 or 8
Westinghouse	Bottom Con. Socket	DSA7 DSA7M DSA7W DSA7W	—	—	7 or 8 —

#### Transformer Rated Types

Duncan

General Electric

Sangamo

Westinghouse

Not shown in RFA Bulletin 161-12

ga-4  
July 1987

Singlephase - 2-1/2 element - 4 wire type - (120/208) (277/480) volt

Self-Contained Types Manufacturer 1	Type of Base 2	Watthour Meter Type 3	Mechanical Demand Watthour Type 4	Thermal Demand Watthour Type 5	Number of Terminals 6
Duncan	Bottom Con. Socket	MT-14S	BMT-14S	TMT-14S	7
General Electric	Bottom Con. Socket	V65A V65S	VH65A VH65S	-	7
Sangamo	Bottom Con. Socket	SSA SSS	SSDA SSDS	-	-
Westinghouse	Bottom Con. Socket	D5AB D5SB	D5SSM	-	7 or 8
<u>Transformer Rated Types</u>					
Duncan	Bottom Con. Socket	MT-6A MT-7S or 6S	BMT-6A BMT-7S or 6S	TMT-6A TMT-7S or 6S	10 7 or 13
General Electric	Bottom Con. Socket	V65A V65S	VH65A VH65S	-	7 or 13
Sangamo	Bottom Con. Socket	SSA SSS	SSDA SSDS	-	-
Westinghouse	Bottom Con. Socket	D5AB D5SB	D5ABH D5SBM	D4S8H	13

## 9a - Watthour and watthour-Demand Meters

Polyphase - 3 element - 4 wire type - (120/208) (277/480) volt

<u>Self-Contained Types</u>	<u>Type of Base</u>	<u>Watthour Meter Type</u>	<u>Mechanical Demand Watthour Type</u>	<u>Thermal Demand Watthour Type</u>	<u>Number of Terminals</u>
<u>Manufacturer</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
Duncan	Bottom Con. Socket	MT-16S	BMT-16S	-	-
General Electric	Bottom Con. Socket	V64A V64S	VM64A VM64S	-	7 or 8
Sangamo	Bottom Con. Socket	S4A S4S	SADA S4DS	-	7 or 8
Westinghouse	Bottom Con. Socket	D5-A3 D5-S3	DSA3H DSS3H	-	7 or 8
<u>Transformer Rated Types</u>					
Duncan	Bottom Con. Socket	MT-9A MT-9S	MT-9A MT-9S or 10S	BMT-9A BMT-9S or 10S	12 13
General Electric	Bottom Con. Socket	V64A V64S	VM64A VM64S	-	-
Sangamo	Bottom Con. Socket	S4A S4S	SADA S4DS	-	13

Conditional List  
ga(1)  
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ga - Watthour and Watthour-Demand Meters

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>General Electric</u> Socket or bottom connected watthour and watthour-demand meters, 2.5 amp., Class 20, V-60 and VM-60 Series	907 (12/5/68)	1. To obtain experience.
<u>Westinghouse</u> Socket or bottom connected watthour and watthour-demand meters, 2.5 amp., three element Class 20, Types D4S-3, D4S-3M, D4A3 and D4A3M, Types D4A8, D4S8, D4A8M, D4S8M, D4A2, D4S2, D4A2M and D4S2M	960 (2/4/71)      1089 (4/29/76)	1. To obtain experience
Socket base, 3 wire, 10 watthour meter, Type D4S, Class 320	1149 (10/19/78)	1. To obtain experience
<u>Duncan</u> Special base, 3 wire, 10 watthour meter, Type MS-K, Class 400 watthour and mechanical demand Type BMS-K watthour and thermal demand Type TMS-2K	947 (7/9/70)      1113 (4/28/77)	1. To obtain experience 2. To be used only where Class 400 meters are permitted by local regulatory bodies.
Socket base, 3 wire, 10 watthour meter, Type MS-E, Class 300	1113 (4/28/77)	1. To obtain experience 2. To be used only where Class 300 meters are permitted by local regulatory bodies.
<u>Sangamo</u> Socket base, 3 wire 10 watthour meter, Type J4ES, Class 320	1103 (12/2/76)	1. To obtain experience.

gb - Meter Sockets

Manufacturer	Type or Catalog Number		No. Jaws	Rating Amps.
	Ring	Ringless		
Anchor#				
1000 Series (1003-1006)	1000 Series (1003-1006)	4, 5	100	
1100 Series (1100-1109)	1100 Series (1100-1109)	4, 5, 7	150	
1200 Series (1201-1209)	1200 Series (1201-1209)	4, 5	200	
	1200/1300 Series (1275-1300)	4, 5, 7	200	
1600 Series (1600-1661)	1600 Series (1600-1661)	4, 5	320	
1500 Series (1500-1526)	1500 Series (1500-1526)	4, 5	100/125 per sta.	
1500 Series (1530-1536)	1500 Series (1530-1536)	4, 5	150 per sta.	
1500 Series (1540-1546)	1500 Series (1540-1546)	4, 5	200 per sta.	
1400 Series (1405-1473)	1400 Series (1405-1473)	4, 5, 6, 7, 8, 13	20/100	
Crouse-Hinds (Arrow-Hart/ Murray)	SJ Series* (Single) SD Series* (Mult.) SN Series* (Single) SS Series* (Single)	RJ Series* (Single) RD Series* (Mult.) RN Series* (Single) RS Series* (Single) RH Series* (Single)	4, 5, 6 4, 5, 6 4, 5, 6 4, 5, 6 5, 7	100 125 per sta. 100 200 200 HD

\*Available with UL label  
\*UL label

gb-2  
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**gb - Meter Sockets**

Manufacturer	Type or Catalog Number	Rating, Amps.
Duncan	Ring Overhead Singless	100, 200
	C#	200
	COW	200
	HQ#	200
	HQ-T	20
	Underground	200
	CQ-UW	200
	HQ-UW	200
Durham	R-7000 Series# 7000 Series#	4 or 5
	R-71000 Series# 71000 Series#	4 or 5
	R-81000 Series# 81000 Series#	4 or 5
Dyna-Tech	Overhead	200
	1100-C - 1107-C	100
	1300-C - 1307-C	100
	2100-CH-2107-CH	200
	2300-CH-2307-CH	200
	Underground	200
	2590-CHU-2597-CHU	4 & 5
	2790-CHU-2797-CHU	4 & 5
	2990-CHU-2997-CHU	4 & 5
	2290-CHU-2297-CHU	4 & 5
General Electric	R-2#	200
	S-1#	200
	SR-73#	100
	SR-73# for	100
	underground	200
	Sy-60#	100-200, 20
	SR-60#	100
	SI-60	20
General Switch	42100 Series*	100

\*UL Label  
#Available with UL Label

## gb - Meter Sockets

Manufacturer	Type or Catalog Number	No. Jaws	Rating, Amperes
Milbank			
Overhead			
S7462, U7362	3, 4, 5, 6	4 or 5	100
S7486 Series, S7262 Series, S7021 Series, S9550 Series, S9700 Series	R7486 Series*, U7262 Series*, U7021 Series*, U9550 Series*, U9700 Series*	4 or 5	100
S8086-XL, S8084-XL, S7040-XL, S9551-XL, S9701-XL	U8086-XL*, U8084-XL*, U7040-XL*, U9551-XL*, U9701-XL*	4 or 5	100
S8086-XL, S8084-XL, S7040-XL, S9551-XL, S9701-XL	U8086-XL*, U8084-XL*, U7040-XL*, U9551-XL*, U9701-XL*	4 or 5	150
S8086-XL, S8084-XL, S7040-XL, S9551-XL, S9701-XL	U8086-XL*, U8084-XL*, U7040-XL*, U9551-XL*, U9701-XL*	4 or 5	200
S8086-XL, S8084-XL, S7040-XL, S9551-XL, S9701-XL	U8086-XL*, U8084-XL*, U7040-XL*, U9551-XL*, U9701-XL*	4 or 5	(HD)
S8086-XL, S8084-XL, S7040-XL, S9551-XL, S9701-XL	U8086-XL*, U8084-XL*, U7040-XL*, U9551-XL*, U9701-XL*	7	200 (HD)
Underground			
S8086-XL, S8084-XL, S7040-XL, S9551-XL, S9701-XL	U8086-XL*, U8084-XL*, U7040-XL*, U9551-XL*, U9701-XL*	4 or 5	100
S8086-XL, S8084-XL, S7040-XL, S9551-XL, S9701-XL	U8086-XL*, U8084-XL*, U7040-XL*, U9551-XL*, U9701-XL*	4 or 5	150
S8086-XL, S8084-XL, S7040-XL, S9551-XL, S9701-XL	U8086-XL*, U8084-XL*, U7040-XL*, U9551-XL*, U9701-XL*	4 or 5	200
S8086-XL, S8084-XL, S7040-XL, S9551-XL, S9701-XL	U8086-XL*, U8084-XL*, U7040-XL*, U9551-XL*, U9701-XL*	4 or 5	(HD)
S8086-XL, S8084-XL, S7040-XL, S9551-XL, S9701-XL	U8086-XL*, U8084-XL*, U7040-XL*, U9551-XL*, U9701-XL*	7	200 (HD)
Osborn			
ORA-3 Series			
ORA-4 Series	4, 5 (overhead)	150	
ORA-4 Series	4, 5 (overhead)	200	
ORA-5 Series	4, 5 (underground)	150	
ORA-5 Series	4, 5 (underground)	200	

\*UL Label

804  
July 1987

JF. no

<u>Manufacturer</u>	<u>90 - Meter Sockets</u>	<u>Type or Catalog Number</u>	<u>No. Jars</u>	<u>Rating Amps.</u>
<u>Superior</u>				
	<u>Overhead</u>			
8048	501	4, 5	100	100
314*	414*	4, 5	100	150
314*	414*	4, 5	200	200
362 Series	452 Series	4, 5	150 per sta.	150 per sta.
	482 Series*	4, 5	200 per sta.	200 per sta.
	492 Series	7	30 4w Y	30 4w Y
			or Delta	or Delta
			per sta.	per sta.
	RLK Series*	5, 7	200 30 4W Y	200 30 4W Y
			or Delta	or Delta
			600 V	600 V
<u>Underground</u>				
314*	414*	4, 5	100	100
	414*	4, 5	150	150
	414	7	200 30 4w Y	200 30 4w Y
	"RLPK" Series	5, 7	or Delta	or Delta
			200 30 4w Y	200 30 4w Y
			or Delta	or Delta
			600 V	600 V
<u>Westinghouse</u>				
#S	4, 5, 6	4, 5	100	100
STS	5, 6	5, 6	200/400** 16 3w	200/400** 16 3w
STS-2	8	8	200/400** 30 3w	200/400** 30 3w
STS-3	13	13	200/400** 30 4w Y	200/400** 30 4w Y
STS-7	8	8	or Delta	or Delta
STS-8	8 or 13	8 or 13	200/400** 30 4w Delta	200/400** 30 4w Delta
			200/400** 30 4w Y	200/400** 30 4w Y
			200/400 30 4W Y	200/400 30 4W Y
			or Delta	or Delta
			200/400 30 4W Delta	200/400 30 4W Delta
			200/400 16 3w	200/400 16 3w

#Available with UL label

\* UL label

\*\* Transformer rating in first figure: maximum loading shown by second figure

Conditional List  
gb(1)  
July 1987

gb - Meter sockets

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Duncan</u> Meter mounting device 400 ampere, Type K-4# for use with Type MS-K, 10 Duncan meters	947 (7/9/70) 1136 (4/6/78)	1. To obtain experience. 2. To be used only where Class 400 meters are permitted by local regulatory bodies.
Socket type HQ-4S 4 jaws rated for Class 300 service	1136 (4/6/78)	1. To obtain experience. 2. To be used only where Class 300 meters are permitted by local regulatory bodies.
<u>Durham</u> M-400 ampere 4 or 5 jaws for use with Class 10 meters	1086 (3/18/76)	1. To obtain experience.
<u>Milbank</u> Type S1079-F, 4 jaws rated for Class 320 service	1103 (12/2/76)	1. To obtain experience.

#Available with UL label.

gj  
July 1987

gj - Crossarm Assemblies and Arm Spacers

Distribution

Wood crossarm assembly complete with braces  
and attaching hardware, fittings and bolts

Crossarm Assembly

<u>Manufacturer</u>	<u>Crossarm Size (inches)</u>	<u>Catalog No.</u>
Brooks Lumber Company	3-3/4 x 4-3/4 x 8'-0"	3100 F
	3-3/4 x 5-3/4 x 8'-0"	3100 B
	3-3/4 x 7-3/4 x 8'-0"	3100 I
	3-3/4 x 7-3/4 x 10'-0"	3100 J
Cascadian Company	3-1/2 x 4-1/2 x 8'-0"	C500B
	3-3/4 x 5-3/4 x 8'-0"	C500F
	3-3/4 x 7-3/4 x 8'-0"	C500M
Hughes Brothers	3-1/2 x 4-1/2 x 8'-0"	2890A
	3-3/4 x 5-3/4 x 8'-0"	2890B
	3-3/4 x 7-3/4 x 8'-0"	2892-A
	3-3/4 x 7-3/4 x 10'-0"	2892-B

Twin Arm Spacer\*

To be used with standard hardware, 8' x 3-5/8" x 4-5/8" crossarm and 28" wood braces

Flagg PX240

Power Line Hardware CAS-455

\*Restricted to applications where the conductor's maximum design tension is less than 1250 lbs. and to conductor sizes 1/0 ACSR and below.

gw-1  
July 1987

gw - Crossarm Assembly for H-Frame Construction

Applicable Specification: REA Specification T-7, Revision dated November 1962

Applicable Drawing : TH-11B Series (161 kV maximum)  
No braces (TH-11B)  
Two vee braces on outside (TH-11BVO)  
Two vee braces on inside (TH-11BVI)  
Four vee braces (TH-11BV4)

3-5/8" x 9-3/8" x 33' wood crossarm assembly complete with attaching hardware, fittings, bolts and 3-3/8" x 5-3/8" braces.

Catalog Nos. or Drawing Nos.

	<u>TH-11B</u>	<u>TH-11BVO</u>	<u>TH-11BVI</u>	<u>TH-11BV4</u>
(Assemblies)	<u>Items</u> <u>gw</u>	<u>Items</u> <u>gw and vo</u>	<u>Items</u> <u>gw and vi</u>	<u>Items</u> <u>gw and vv</u>
American Crossarm and Conduit Co.(1)	70250	7025VO	7025VI	7025V4
Brooks Lumber (1,2)	6411	6411-1	6411-2	6411-3
Cascadian (1,2)	CCC11B72	CCC11B72-VO	CCC11B72-VI	CCC11B72-V4
Hughes Bros.(1,2)	C3316-B	C3316-B	C3316-B	C3316-B

1 - Fixed spacer fitting sizes as required

2 - Adjustable spacers are available

gw-2  
July 1987

gw - Crossarm Assembly for H-Frame construction  
(Double Arm) 230 kV (Small Angle)

Applicable Specification: REA Specification T-8  
Drawing : TH-231B

Assembly complete with attaching hardware, fittings, bolts and braces.

Crossarm 3-5/8" x 9-3/8"

<u>Manufacturer</u>	<u>Catalog Number</u>
American Crossarm & Conduit (1)	8026VB
Brooks (1, 2)	64231
Cascadian (1, 2)	CCC231B82
Hughes Brothers (1, 2)	C-3338-B

Crossarm 5-1/8" x 7-1/2"

Brooks (1, 2)	64231L
Cascadian (1, 2)	CCC231BT
Hughes (1, 2)	C-3338-BL

- 1 - Fixed spacer fitting sizes as required.  
2 - Adjustable spacers are available.

Conditional List  
gw(1)  
July 1987

gw - Crossarm Assembly for H-Frame Construction

Applicable Specification: REA Specification T-7

Applicable Drawing: Drawing TH-11B Series (161 kV maximum)

Condition: These adjustable spacers are not interchangeable with fixed spacers, and are only for use where the Borrower has determined that interchangeability with fixed spacers or standard adjustable spacers will not be required in the future.

<u>Catalog Numbers or Drawing Numbers</u>			
<u>TH-11B</u>	<u>TH-11BV0</u>	<u>TH-11BVI</u>	<u>TH-11BV4</u>

American Crossarm & Conduit	70250	7025V0	7025VI	7025V4
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Conditional List  
gw(2)

gw - Crossarm Assembly for H-Frame Construction  
(Double Arm) 230 kV (Small Angle)

Applicable Specification: REA Specification T-8

Applicable Drawing: Drawing TH-231B

Condition: These adjustable spacers are not interchangeable with fixed spacers, and are only for use where the Borrower has determined that interchangeability with fixed spacers or standard adjustable spacers will not be required in the future.

<u>Catalog Numbers or Drawing Numbers</u>	
<u>Crossarm 3-5/8" x 9-3/8"</u>	

American Crossarm & Conduit	8026VB
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gx-1  
July 1987

**gx - Single Pole Steel Structures with Arms**

**Applicable Specification:** REA Specification for Single Pole Steel Structures Complete with Arms, T-9

**Manufacturer**

Meyer

Single Circuit,  
delta conductor  
arrangement - Type 1  
Single circuit,  
vertical conductor  
arrangement - Type 2  
Double circuit conductor  
arrangement - Type 3  
Single circuit, large angle  
arrangement - Type 4

Union Metal

Single circuit,  
delta conductor  
arrangement - Type D  
Single circuit,  
vertical conductor  
arrangement - Type E  
Double circuit conductor  
arrangement - Type H  
Single circuit, large angle  
arrangement - Type K

gx - Single Pole Steel Structures with Arms

Applicable Specification: REA Specification for Single Pole Steel Structures complete with Arms, T-9

<u>Manufacturer</u>	<u>Type</u>
C-E American	Single circuit, delta conductor arrangement - Type 1
	Single circuit, vertical conductor arrangement - Type 2
	Double circuit conductor arrangement - Type 3
	Single circuit, large angle arrangement - Type 4
Muskogee Iron Works	Single circuit, delta conductor arrangement - Type SCD
	Single circuit, vertical conductor arrangement - Type SCV
	Double circuit conductor arrangement - Type DC
	Single circuit, large angle arrangement - Type SCV
Power Enterprises, Inc.	Single circuit, delta conductor arrangement - Type 1
	Single circuit, vertical conductor arrangement - Type 2
	Double circuit conductor arrangement - Type 3
	Single circuit, large angle arrangement - Type 4

gx-3  
July 1987

gx - Single Pole Steel Structures with Arms

Applicable Specification: REA Specification for Single Pole Steel Structures Complete with Arms, T-9

<u>Manufacturer</u>	<u>Type</u>
Anchor Metals	Single circuit delta conductor arrangement - TUS-1 Single circuit, vertical conductor arrangement - TUS-2 Double circuit conductor arrangement - TUS-3 Single circuit, large angle arrangement - TUS-4
Valmont Industries, Inc.	Single circuit delta conductor arrangement S/C-DC Single circuit, vertical conductor arrangement S/C-VC Double circuit conductor arrangement D/C-SC Single circuit, large angle arrangement S/C-L/A

gy-1  
July 1987

gy - Crossarm Assembly for H-Frame Construction  
(Double Arm)

Applicable Specification: REA Specification T-7, Revision dated November 29, 1962

Applicable Drawing: TH-10 Series  
No braces (TH-10)  
Two vee braces on outside (TH-10VO)  
Two vee braces on inside (TH-10VI)  
Four vee braces (TH-10V4)

3-5/8" x 9-3/8" x 32' wood crossarm assembly complete with attaching hardware, fittings, bolts and 3-3/8" x 5-3/8" braces.

Catalog Nos. or Drawing Nos.

(Assemblies)	<u>TH-10</u>	<u>TH-10VO</u>	<u>TH-10VI</u>	<u>TH-10V4</u>
	<u>Items</u>	<u>Items</u>	<u>Items</u>	<u>Items</u>
American Crossarm & Conduit Co.(1)	gy	gy and vo	gy and vi	gy and vv
Brooks Lumber(1,2)	70208	70228	702281	70248
Cascadian (1,2)	6410	6410-1	6410-2	6410-3
Hughes Bros. (1,2)	CCC1071	CCC1071-VO	CCC1071-VI	CCC1071-V4
Niedermeyer-Martin (1)	C-3316-A	C3316-A	C-3316-A	C-3316-A
	N-6710	N-6711	N-6712	N-6713

1 - Fixed spacer fitting sizes as required

2 - Adjustable spacers are available

gy-2  
July 1987

gy - Crossarm Assembly for H-Frame Construction  
(Double Arm) 230 kV (Tangent)

Applicable Specification: REA Specification T-8

Applicable Drawing: TH-230

Assembly complete with attaching hardware, fittings, bolts and braces.

Crossarm 3-5/8" x 9-3/8"

<u>Manufacturer</u>	<u>Catalog No.</u>
American Crossarm & Conduit (1)	8025V4
Brooks (1, 2)	64230
Cascadian (1, 2)	CCC23081
Hughes (1, 2)	C-3338-A
Niedermeyer-Martin (1)	N-6720

Crossarm 5-1/8" x 7-1/2"

Brooks (1, 2)	64230L
Cascadian (1, 2)	CCC230T
Hughes (1, 2)	C-3338-AL

1 - Fixed spacer fitting sizes as required.

2 - Adjustable spacers are available.

Conditional List  
gy(1)  
July 1987

gy - Crossarm Assembly for H-Frame Construction  
(Double Arm)

Applicable Specification: REA Specification T-7

Applicable Drawing: Drawing TH-10 Series

Condition: These adjustable spacers are not interchangeable with fixed spacers, and are only for use where the Borrower has determined that interchangeability with fixed spacers or standard adjustable spacers will not be required in the future.

<u>Catalog Numbers or Drawing Numbers</u>			
<u>TH-10</u>	<u>TH-10V0</u>	<u>TH-10VI</u>	<u>TH-10V4</u>

American Crossarm & Conduit	70208	70228	70228I	70248
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Conditional List

gy(2)

July 1987

gy - Crossarm Assembly for H-Frame Construction  
(Double Arm)

Applicable Specification: REA Specification T-8

Applicable Drawing: Drawing TH-230

Condition: These adjustable spacers are not interchangeable with fixed spacers, and are only for use where the Borrower has determined that interchangeability with fixed spacers or standard adjustable spacers will not be required in the future.

Crossarm 3-5/8" x 9-3/8"  
Catalog Number

American Crossarm &  
Conduit

8025V4

gz-1  
July 1987

gz - Crossarm Assembly for Wishbone Construction "Z" Type  
(Single Arm)

Applicable Specification: REA Specification T-5

Applicable Drawings: REA Drawings TSZ-1 and TMZ-1

3-5/8" x 5-5/8" wood crossarm assembly complete with  
brace and attaching hardware, fittings, and bolts

The following manufacturers have shown compliance with the applicable  
specifications for this assembly:

<u>Manufacturer</u>	<u>Catalog Nos. or Drawing Nos.</u>
American Crossarm & Conduit Co.	601TSZ and 602TSZ
Brooks Lumber	6421
Hughes Brothers	C-3162-A and C-3162.10

gz-2  
July 1987

gz - Crossarm Assembly for Wishbone Construction, "Z" Type  
(Double Arm)

Applicable Specification: REA Specification T-5

Applicable Drawings: REA Drawings TSZ-2, and TMZ-2

3-5/8" x 5-5/8" wood crossarm assembly complete with  
brace and attaching hardware, fittings and bolts

The following manufacturers have shown compliance with the applicable  
specifications for this assembly:

<u>Manufacturer</u>	<u>Catalog Nos. or Drawing Nos.</u>
American Crossarm & Conduit Co.	602TSZ
Brooks Lumber (2)	64Z2
Hughes Brothers	C-3162-B and C-3162.10

(2) Adjustable spacers are available.

sb - Switch, disconnect (single-pole, hook operated station class)

NEMA standard switches for station or line  
structure use where single-pole switching is permissible

<u>Manufacturer</u>	<u>Type</u>	<u>Voltage Ratings</u>	<u>System Voltages</u> <u>Line to Line</u>
Bridges	EH	15 thru 69 kV	12.5 thru 69 kV
	EHL(L)	15 thru 34.5 kV	12.5 thru 34.5 kV
Brown Boveri Electric (ITE)	HPL	15 thru 69 kV	12.5 thru 69 kV
G & W Electric	B-2M	15 thru 69 kV	12.5 thru 69 kV
	EV(PL)	15 thru 34.5 kV	12.5 thru 34.5 kV
Hi-Voltage (Joslyn)	HU	15 thru 34.5 kV	12.5 thru 34.5 kV
	HI	15 thru 34.5 kV	12.5 thru 34.5 kV
Johnson	HPT	15 thru 69 kV	12.5 thru 69 kV
Kearney	M-72(PL)	15 thru 69 kV	12.5 thru 69 kV
	H-72	15 thru 34.5 kV	12.5 thru 34.5 kV
McGraw-Edison	D2(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
MEMCO	STV	15 thru 69 kV	12.5 thru 69 kV
	STU	15 thru 69 kV	12.5 thru 69 kV
Morgan	DHS(PL)	15 thru 69 kV	12.5 thru 69 kV
ITT Royal Switchgear	BT	15 thru 69 kV	12.5 thru 69 kV
	BLT(PL)	15 and 23 kV	12.5 thru 24.9 kV
S & C	LBD(PL)	15 thru 34.5 kV	12.5 thru 34.5 kV
	Alduti (L)	15 and 25 kV	12.5 thru 24.9 kV
Seeco	BT	34.5 thru 69 kV	34.5 thru 69 kV
Siemens-Allis	HA	15 thru 69 kV	12.5 thru 69 kV
	HS(PL)	15 and 25 kV	12.5 thru 24.9 kV

(L) Means solid material load interrupters are available and accepted.

(LV) Means vacuum interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available for voltages 34.5 kV and below. Consult switch manufacturer concerning loop switching applications at higher voltages.

sb-2  
July 1987

sb - Switch, disconnect (single-pole, hook-operated station class)

NEMA standard switches for station or line  
structure use where single-pole switching is permissible

<u>Manufacturer</u>	<u>Type</u>	<u>Voltage Ratings</u>	<u>System Voltages Line-to-Line</u>
Southern States	PBO	15 thru 69 kV	12.5 thru 69 kV
	*PBN	15 thru 23 kV	12.5, 13.2, 24.9 kV
USCO	HH(PL)	15 thru 69 kV	12.5 thru 69 kV

(L) Means solid material load interrupters are available and accepted.

(LV) Means vacuum interrupters are available and accepted.

\* With steel base only.

(PL) Means hooks for portable load interrupters are available for voltages 34.5 kV and below. Consult switch manufacturer concerning loop switching applications at higher voltages.

sb - Switch, disconnect (single-pole, hook operated distribution class)\*

For distribution line use where power class insulation is not required and single-phase switching is permissible.

(Not suitable for substation use)

<u>Manufacturer</u>	<u>Type</u>	<u>Voltage Rating</u>	<u>System Voltage Line-to-Line</u>
Chance	M3(PL)	15 and 27 kV	12.5 thru 24.9 kV
G & W Electric Company	EV(PL)	15 kV	12.5 kV
Kearney	D-73(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
McGraw-Edison	D2(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
Morgan	DHS (PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
ITT Royal	BLT(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
S & C	LBD (PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
Siemens-Allis	HD(PL)	15 and 25 kV	12.5 thru 24.9 kV

NOTE: Switches on this page must be furnished with four bolts for double crossarm mounting.

(L) Means solid material load interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available.

(LV) Means vacuum interrupters are available and accepted.

\*Steel bases only.

Conditional List  
sb(1)  
July 1987

sb - Switch, hookstick  
(line tension switches)

for use on 12.5/7.2 kV systems only

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Blackburn</u> IL68-H	1332 (12/4/86)	To obtain experience.
<u>Bridges</u> 125	1279 (5/3/84)	To obtain experience.
<u>Chance</u> LTD06150-H	1279 (5/3/84)	To obtain experience.

NOTE: All switches listed on this page have hooks for portable load  
interrupters.

sc-1  
July 1987

sc - Regulators, Voltage  
12.5/7.2 kV  
13.2/7.62 kV

Applicable Specification: REA "Specification for Substation Regulators,"  
S-2.

<u>Type</u>	<u>Size</u>	<u>Description</u>
	<u>General Electric</u>	
VR-1	38.1 - 509 kVA	(SL) Single-phase - step type
MLT	500 - 1000 kVA	(S) Three-phase - step type
VML-32	500 - 833 kVA	(S) Single-phase - Vacuum step type
VMLT-32	1200 - 2800 kVA	(S) Three-phase - vacuum step type
	<u>McGraw-Edison</u>	
VR-32	19.1 - 833 kVA	(SL) Single phase - step type
AB	50 amp.	(L) Single-phase - step type (Auto-Booster)
	<u>Siemens-Allis</u>	
JFR	38.1 - 667 kVA	(SL) Single-phase - step type
	<u>Westinghouse</u>	
UTS, UTT	167-1000 kVA	(S) Three phase step type

(L) Indicates line use

(S) Indicates substation use

SC-2  
July 1987

SC - Regulators, Voltage  
24.9/14.4 kV

Type	Size	Description
<u>General Electric</u>		
VR-1	72 - 576 kVA	(SL) Single phase - step type
VML-32	500 - 833 kVA	(S) Single phase - vacuum step type
VMLT-32	1200 - 4666 kVA	(S) Three phase - vacuum step type

McGraw-Edison

VR-32	72 - 833 kVA	(SL) Single phase - step type
AB	50 amp.	(L) Single phase - step type (Auto-Booster)

Siemens-Allis

JFR	72 - 833	(SL) Single phase - step type
-----	----------	-------------------------------

(L) Indicates line use

(S) Indicates substation use

Conditional List  
SC  
July 1987

sc - Regulators, Voltage

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Siemens-Allis</u> Three-phase, step-type substation regulator Type SFR (13.2/7.62 KV)	657 (11/24/58)	To obtain experience.
<u>General Electric</u> Three-phase, step-type substation regulator Type TMLT-32 (13.2/7.62 KV)	723 (9/28/61)	To obtain experience.

sd  
July 1987

sd - Current Transformers  
Outdoor Type

<u>Manufacturer</u>	<u>.6 kV</u>	<u>15 kV</u>	<u>25 kV</u>	<u>34.5 kV</u>	<u>69 kV</u>
Andover	DCBW DCCW DCAB				
Associated Engineering	GT HA HEO	BB-15 LG-15	BB-25 LG-25 COF	LG-34.5 COF	COF-350
Astra	AA TFW AB AD				
Electromagnetic Industries (Square D)		C03-110	C03-150	C03-200	1K-350
General Electric	JCR-0 JCH-0 JAK-0 JAD-0	JKH-5 JCK-5	JKH-6 JKH-150 KG-150	JKH-7 JKH-200 KG-200	JKH-350 KG-350
Sangamo	R6S R6SA R6M R6L				
Westinghouse	CSF/CMS CMF CLC/CLE	KOR-11 KON-11		ICT-150 KOR-15	ICT-00 ICT-50

NOTE: The transformer types listed above are accepted in all standard ratios. Insulation class, voltages, ratios and other necessary information should be specified when ordering.

Conditional List  
sd  
July 1987

sd - Current Transformers  
Outdoor Types

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Electromagnetic Ind. (Square D)</u>		
Type UMCT, 0.6 kV	971(7/15/71)	To obtain experience.
Type UCT, 0.6 kV		
Type IK 4-350-69, 69 kV (cycloaliphatic resin bushings)	1325 (8/14/86)	
<u>Balteau Standard</u>		
Type KEWO-110, 15 kV	1212 (5/21/81)	To obtain experience.
Type KEWO-150, 25 kV		
Type KEWO-200, 34.5 kV		
Type KEWO-350, 69 kV		

se  
July 1987

se - Voltage Transformers

Outdoor Types

<u>Manufacturer</u>	<u>.6 kV</u>	<u>15 kV</u>	<u>25 kV</u>	<u>34.5 kV</u>	<u>69 kV</u>
Andover	DVE-6 DVF-6				
Associated Engineering	CL TL	PTT-150 SPOF-100 PTT-110	PTT-150 SPOF-150	POF-200	POF-350
Electromagnetic Industries (Square D)		PO5-110	PO5-150	PO5-200	U3-350-69
General Electric	JVA-0 JVP-0	JVW-5 JVW-110	JVW-6 ET-150 JVT-150	JVW-7 ET-200 JVT-200	ET-350 JVT-350
Sangamo	T5R T6R T7R				
Westinghouse	PPM	VOG-11 VOZ-11	PTOM-150 LPT-150	LPT-200	LPT-350

NOTE: The transformer types listed above are acceptable in all standard ratios. Insulation class, voltages, ratios and other necessary information should be specified when ordering.

Conditional List  
se  
July 1987

se - Voltage Transformers

Outdoor Types

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Astra</u>		
Type DB, 0.6 kV	1087 (4/1/76)	To obtain experience.
Type DA, 0.6 kV		
Type DF, 0.6 kV	1261 (6/23/83)	
<u>Balteau Standard</u>		
VE02-110, 15 kV	1212 (5/21/81)	To obtain experience.
VE05-110, 15 kV		
<u>Electromagnetic Industries (Square D)</u>		
Type U-450, 0.6 kV	1080 (12/23/75)	To obtain experience.
Type U-4-350-69, 69 kV (cycloaliphatic resin bushings)	1325 (8/14/86)	

sj  
July 1987

sj - Switches, oil circuit recloser by-pass

<u>Manufacturer</u>	<u>15 kV for Use on 12.5/7.2 kV Systems</u>	<u>27 kV for Use on 24.9/14.4 kV Systems</u>	<u>Current Rating Amperes</u>
Kearney	D73RB	D73RB	600
McGraw-Edison	FW77D7	FW77D9	600

sk  
July 1987

sk - Switch, regulator by-pass - disconnect  
For outdoor use

<u>Manufacturer</u>	<u>15 kV for use on 12.5/7.2 kV Systems</u>	<u>27 kV for use on 24.9/14.4 kV Systems</u>	<u>Current Rating Amperes</u>
Kearney	HB-65	HB-65	600
S & C Electric	XL	XL	600
Siemens-Allis	HR	HR	600
Southern States	BR	BR	400,600

NOTE: All switches should be furnished with NEMA standard insulators and with 110 kV BIL rating (15 kV systems) or 150 BIL ratings (25 kV systems) for station use.

Conditional List  
sk  
July 1987

sk - Switch, regulator by-pass - disconnect  
For outdoor use

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
McGraw-Edison Type B, 15 kV, 400 amperes 110 kV BIL for station use 95 kV BIL for line use.	1035 (2/21/74)	To obtain experience

NOTE: All switches should be furnished with NEMA standard insulators and  
with 110 kV BIL rating for station use.

S1  
July 1987

s1 - Switch, Combination Power Fuse and Disconnect

(Used with an additional disconnect switch to by-pass  
oil circuit reclosures at substations.)

<u>Manufacturer</u>	<u>15 kV for use on 12.5/7.2 kV systems</u>	<u>27 kV for use on 24.9/14.4 kV systems</u>
Hi Voltage	RFH	
Kearney	MHX	MHX
S & C Electric	SMD/LBD XS/LBD	SMD/LBD
ITT Royal Switchgear	TUF	
Southern States	SF	

NOTE: All switches and cutouts should be furnished with NEMA standard insulators.

## Conditional List

sr

July 1987

sr - Steel for Substation Grounding, Copper-Clad or Galvanized

(See av-2 for copper grounding conductor)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Copperweld Steel</u> 40% conductivity DSA Copperweld Strand in sizes: 1/2" (7 No. 6 AWG) 9/16" (7 No. 5 AWG) 5/8" (7 No. 4 AWG) 13/16" (19 No. 6 AWG) 7/8" (19 No. 5 AWG)	954 (10/29/70)	1. To obtain experience 2. When used in soil with resistivity of 25 ohmmeters (2500 ohms per centimeter cube) or less cathodic protection must be incorporated into the grounding design.
<u>Indiana Steel &amp; Wire</u> Steel Strand, BB Grade, Class C galvanized 5/8" (19 wire) 1/2" (7 wire) 9/16" (7 wire) 7/16" (7 wire)	1004 (11/16/72)  1133 (2/16/78)	1. To obtain experience 2. When used in soil with resistivity of 25 ohmmeters (2500 ohms per centimeter cube) or less cathodic protection must be incorporated into the grounding design.
<u>Bethlehem Steel</u> 7/16" and 1/2" steel strand, BB grade, Class C galvanized	1015 (4/26/73)	1. To obtain experience 2. When used in soil with resistivity of 25 ohmmeters (2500 ohms per centimeter cube) or less, cathodic protection must be incorporated into the grounding design.

vx  
July 1987

vx - Cross Brace assembly, 3-3/8" x 5-3/8"  
with hardware and fittings (Dwg. TM-110, REA Specification T-7

<u>Manufacturer</u>	<u>Catalog No.</u>
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American Crossarm & Conduit

Item 1-vx	1100-1
Item 2-vx	1100-2

Hughes Brothers

Item 1-vx	1042-1
Item 2-vx	1042-2

Brooks Lumber

Item 1-vx	X6685-1
Item 2-vx	X6685-2

Niedermeyer-Martin

Item 1-vx	N-6714-1
Item 2-vx	N-6714-2

Cascadian

Item 1-vx	CCC-67-1
Item 2-vx	CCC-67-2

Cross Brace Assembly, 3-5/8" x 7-1/2" Min.  
with hardware and fittings

Applicable Specification: T-8  
Drawing: TM-110A

<u>Manufacturer</u>	<u>Catalog No.</u>
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American Crossarm & Conduit	1200
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Brooks	X-6695
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Cascadian	CCC69
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Hughes	2061A
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Niedermeyer-Martin	N6721
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## PART II

### Underground Distribution Equipment

The realm of underground distribution has made quite significant advances in the past few years. Due to these advances and the increasing feasibility of underground rural distribution, most REA borrowers have placed some distribution equipment underground, are presently planning to, or are anticipating doing so in the future. If borrowers are to obtain reliable and economical underground systems, approved standards for construction and equipment must be observed.

Underground equipment considered suitable is being included in the "List of Materials Acceptable for Use on Systems of REA Electrification Borrowers." Specifications have been written and are available on much of this equipment. It must be realized that very little operating experience is available on this type equipment. Therefore, much of the underground equipment will be listed as "Conditional" until such experience is obtained that will warrant removing the "Conditional" listing. Listing of an item as "Conditional" does not mean that the item is inferior. Conditional means that service experience is desired so the item can be properly evaluated and demonstrate satisfactory performance before consideration for final acceptance.

Any comments or suggestions regarding the use or operation of the listed underground equipment will be welcome.

U ae  
July 1987

U ae - Surge Arresters, Distribution  
for Underground System Pole Risers  
(Lightning Arresters)

<u>Manufacturer</u>	<u>Arrester Class</u>	<u>Arrester Type</u>	<u>Ratings - kV</u>
General Electric	Distribution, heavy duty	Alugard	9, 10, 18
Joslyn	Distribution, normal duty	Q	9/10, 18
	Distribution, heavy duty	J	9/10, 18
Kearney	Distribution, heavy duty	Unigap	9, 10, 18
McGraw-Edison	Distribution, normal duty	ES	9/10, 18
	Distribution, heavy duty	EL	9, 10, 18
Ohio Brass	Distribution, normal duty	DA-III	9/10, 18
	Distribution, heavy duty	DA-IV	9, 10, 18
	Intermediate	GP	9, 10, 18
Westinghouse	Distribution, normal duty	GLV	9, 10
	Distribution, normal duty	LVBB	18

\*Has intermediate class arrester characteristics but does not have intermediate class venting capability.

NOTE: The arresters listed on this page may be used singly or in parallel, but must be applied in accordance with paragraph VI.A., in REA Bulletin 61-3, "Underground Rural Distribution." Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with this bulletin.

Conditional List  
U ae(1)  
July 1987

U ae - Arresters, Surge

(Shielded for Underground System Pad-Mounted Equipment)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Joslyn Metal Oxide, Elbow Arrester Type ZE, 10, 18kV	1297 4/11/85	To obtain experience
McGraw-Edison Metal oxide, AMOV1 U.D. 10, 18 KV	1223 11/19/81	To obtain experience.
RTE Metal Oxide Elbow Arrester M.O.V.E. 9, 18 kV	1185 4/24/81	To obtain experience.

## Conditional List

U ae(2)

July 1987

## U ae - Arresters, Surge

## (For Underground System Pole Risers)

General Electric

Metal Oxide, Tranquell\*\*                    1292                    To obtain experience.  
 U.D. II 9, 10, 18 kV                        1/10/85

Metal Oxide, Tranquell                        1197                    To obtain experience.  
 Intermediate Class                              10/9/80  
 9, 10, 18 kV

Joslyn

Metal Oxide, Type ZJ                        1266                    To obtain experience.  
 U.D. 9, 10, 18 kV                            9/22/83

McGraw-Edison

Metal Oxide, AVZ 18                        1223                    To obtain experience.  
 9/10, 18 kV                                    11/9/81

Metal Oxide AZR                                1287                    To obtain experience.  
 Intermediate class                              9/27/84  
 10, 18 kV

Ohio Brass

Metal Oxide, DynaVar VR                    1236                    To obtain experience.  
 UD 9, 10, 18 kV                              6/10/82

Metal Oxide, DynaVar                        1236                    To obtain experience.  
 Intermediate Class                              6/10/82  
 9, 10, 18 kV

Westinghouse

Metal Oxide, HMX                            1320                    To obtain experience.  
 HEAVY DUTY: 9, 10, 18 kV                    5/8/86

Metal Oxide, RMX                            1320                    To obtain experience.  
 Intermediate Class\*                            5/8/86  
 9, 10, 18 kV

\*Has intermediate class arrester characteristics but does not have  
 intermediate class venting capability.

\*\*A non fragmenting U.D. II Arrester is available for 9 & 10 kV designs  
 at higher cost when specified.

U an-1  
July 1987

U an - Transformers, distribution  
pad-mounted, dead-front

(For underground application)

Applicable Specifications: "REA Specifications for Pad-Mounted  
Transformers," U-5.

<u>Manufacturer</u>	<u>Single Phase</u>	<u>Three-Phase</u>
Central Moloney (2, 4)	"REA-LP" 25-167 kVA	
Dowzer (3, 4)	"METRI-PAD" 25-167	"PM3W-R" 75-500 kVA
ERMCO (2, 4)	"Low-Profile" 10-167 kVA	
General Electric (2, 4)	"Mini-Pad III - REA" 10-167 kVA	"Compad II - REA" 75-2500 kVA
Howard (2, 4)	"Hi Pad REA" 10-167 kVA	"Hi Pad 3 REA" 45-2500 kVA
Kuhlman (2, 4)	"Lo-Pak ELR" 25-167 kVA	"K-PAK-3 REA" 750-2500 kVA
McGraw-Edison (2, 4)	Series 20/20 REA 25-167 kVA	"REA Pad-Mount" 75-2500 kVA
NECO/Hammond (2)	HMM-R, 10-50 kVA SP-R, 75-167 kVA	TP-R, 45-1000 kVA
Pauwels-Chance(2,4)	"Turf-Hugger-R" 10-100 kVA	"Turf-hugger-R" 45-500 kVA
H. K. Porter (2, 4) (Delta-Star)	"Low Profile U 5-R" 25-167 kVA	"Porter U5-R3" 225-2500 kVA
RTE (2, 4)	"REA Shrubline" 15-167 kVA	"REA Terra-Tran" 45-2500 kVA
United (Ky, AEC)(2, 4)	"Pad-Mount" 15-75 kVA	

- (1) 7.2/12.5 and 7.6/13.2 kV
- (2) 7.2/12.5, 7.6/13.2 and 14.4/24.9 kV
- (3) 7.2/12.5 and 7.6/13.2 kV (conditional listing for 14.4/24.9 kV)
- (4) Dual Voltage - Same as for 14.4/24.9 kV, single phase
- (5) Three-phase listing applies to 7.2/12.5 and 7.6/13.2 kV only
- (6) 14.4/24.9 kV

U an-1.2  
July 1987

U an - Transformers, Distribution,  
Pad-Mounted, Dead-Front

(For Underground Application)

Applicable Specifications: REA Specifications for Pad-Mounted  
Transformers - U5

<u>Manufacturer</u>	<u>Single Phase</u>	<u>Three-Phase</u>
VanTran (3, 4)	"Mini-Pad U5" 5-167 kVA	"VanTran III-U5" 30-2500 kVA
Wagner (Turbodyne)(2, 4)	"Turfline II-R" 25-167 kVA	
Westinghouse 2, 4)	"Mini-Pak U-5" 25-167 kVA	Type MTR 75-1500 kVA "Plazapad-U5" 2000-2500 kVA

- (1) 7.2/12.5 and 7.6/13.2 kV
- (2) 7.2/12.5, 7.6/13.2 and 14.4/24.9 kV
- (3) 7.2/12.5 and 7.6/13.2 kV (conditional listing for 14.4/24.9 kV)
- (4) Dual voltage - same as for 14.4/24.9 kV, single phase
- (5) Three-phase listing applies to 7.2/12.5 and 7.6/13.2 kV only

U an-2  
July 1987

U an - Transformers, Distribution  
Pad-Mounted, Dead-Front

(For unit residential underground application, 7.2/12.5  
and 7.6/13.2 kV, 5-25 kVA single phase only)

<u>Manufacturer</u>	<u>Type</u>
Central Moloney	"REA-Mini-LP" 10-25 kVA
ERMCO	"REA-Micro Pad" 10-25 kVA
General Electric	"Micro-Mini-Pad" 10-25 kVA
Howard	"Spacesaver Pad" 10-25 kVA
McGraw-Edison	"Series 10/15 REA" 10-25 kVA
NECO/Hammond	"Little NECO-R" 10-25 kVA
Pauwels-Chance	"Turf Hugger II" 10-25 kVA
RTE	"Ranch Runner" 10-25 kVA
VanTran	"Mite'E'Mini" 5-25 kVA
Westinghouse	"Micro-Pak U-5" 10-25 kVA

Conditional List

U an(1)

July 1987

U an - Transformers, Distribution  
Pad-Mounted, Dead-Front

(For underground application)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>General Electric</u> Single phase transformers with internal Tranquell Under-Oil Arrester . "Mini-Pad III - REA" (10-167 kVA) 7.2/12.5 and 7.6/13.2, 14.4/24.9 kV and Dual Voltage	1316 (3/6/86)	To obtain experience.
"Micro-Mini-Pad" (10-25 kVA) 7.2/12.5 and 7.6/13.2 kV	1316 (3/6/86)	To obtain experience.
Three phase transformers with internal Tranquell Under-Oil Arrester "Compad II-REA" 7.2/12.5, 7.6/13.2, 14.4/24.9 kV and Dual Voltage	1316 (3/6/86)	To obtain experience.
Single-phase "Mini Pad-REA" 25 & 50 kVA transformers with amorphous metal cores 7.2/12.5, 7.6/13.2, 14.4/24.9 kV and Dual Voltage	1320 5/8/86	To obtain experience.
<u>Hevi-Duty</u> Three-Phase SBI-DF 750-2500 kVA 7.2/12.5 & 7.6/13.2 kV	970 (7/1/71)	1. To obtain experience.
	1153 (12/21/78)	2. Test reports on 750 and 2000 kVA to be submitted as available.
<u>Square D</u> Three-phase Class 7230 REA 75-2500 KVA 12.5/7.2 & 13.2/7.6 kV	1298 (4/25/85)	To obtain experience.

Conditional List  
U an(2)  
July 1987

U an - Transformers, distribution, submersible

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Central Moloney</u> Type URD, 25-100 kVA	843 (6/16/66)	To obtain experience.
<u>General Electric</u> Type RST, 25-100 kVA	847 (8/11/66)	To obtain experience.
<u>Howard</u> 25-100 kVA	1139 (5/18/78)	To obtain experience.
<u>Kuhlman</u> 25-100 kVA	901 (9/12/68)	To obtain experience.
<u>McGraw-Edison</u> 25-100 kVA	857 (1/12/67)	To obtain experience.
<u>RTE</u> "Vaultran Type H" 15-100 kVA	870 (6/29/67)	To obtain experience.
<u>Westinghouse</u> Type SPB, 25-100 kVA	843 (6/16/66)	To obtain experience.

U ax  
July 1987

U ax - Cutout and Arrester, Combination  
for Underground System Pole Risers

Nominal System Voltage	For 12.5Y/ 7.2 kV	For 13.2Y/ 7.6 kV	For 24.9Y/ 14.4 kV
Cutout Maximum Voltage Rating	7.8 kV 10	15 kV 30	15 kV 10 and 30
Application	Risers	Risers	Risers Risers
Cutout Current Rating	100 amps	100 amps	100 amps

Manufacturer	Catalog Numbers			
Chance	C71D-112PB Series	C71D-112PB Series	C71D-112PB Series	C71F-211PB Series
General Electric	9F80	9F80	9F80	9F80
Joslyn	J9237-P2	J9237-P2/R	J9237-P2-R	J9267-D2
McGraw-Edison	AFS300B Series	AFS300C Series	AFS300C Series	AFS300D Series
Southern States	CA Series	CA Series	CA Series	CA Series
Westinghouse	7.8LBU-II/ 10 LV	15LBU-II/ 10 LV	15LBU-II/ 10 LV	24.9LBU-II/ 18 LV

NOTE: The units listed on this page may be used with single arresters or arresters in parallel, but must be applied in accordance with paragraph VI.A. in REA Bulletin 61-3, "Underground Rural Distribution." Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with this bulletin.

Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

Either normal duty or heavy duty distribution class arresters listed on page ae-1 are acceptable for use with these combination units.

U ax - Cutout and Arrester

Combination for Underground System Pole Risers

Nominal System Voltage	for 12.5Y/7.2 KV	for 13.2Y/7.6 KV	for 24.9Y/14.4 KV	Conditions
Cutout Maximum Voltage Rating	7.8 KV	15 KV	15 KV	21 KV
Application	10 30	10 and 30	10 and 30	10 and 30
Risers	Risers	Risers	Risers	Risers
Cutout Current Rating	100 amps	100 amps	100 amps	100 amps

Metal Oxide Type Arresters

Manufacturer

Joslyn (Distribution)  
Meeting No. 1266 (9/22/83)

Catalog Numbers

To obtain experience.

J9237-ZJ2

J9237-ZJ2/R

J9267-ZJ2

Note 1: Other arresters listed on pages ae-1 and ae-1 may be used for underground systems when applied in accordance with REA Bulletin 61-3, "Underground Rural Distribution."

Note 2: Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

Conditional List  
U ax  
July 1987

U cg  
July 1987

U cg - Switch, air, three-pole, group-operated  
for pole-mounted cable risers  
(Factory Preassembled)

<u>Manufacturer</u>	<u>Mounting</u>	<u>Vertical Break</u> <u>Type</u>	<u>Side Break</u> <u>Type</u>	<u>kV</u>
Chance	Vertical Horizontal		D7(L)15-27 D7(L)15-27	
S & C	Vertical Horizontal		Alduti(L)15-25 Alduti(L)15-25	
Westinghouse	Vertical	LB3-VR(L)15		

(L) Means gas or solid material full-load interrupters are accepted and available.

NOTE: Switches with factory-assembled crossarm type bases must have nonconducting crossarm type bases, nonconducting braces, and insulated interphase and control rods.

U fw  
July 1987

U fw - Secondary Tap Connector

<u>Manufacturer</u>	<u>Type or Catalog No.</u>
Blackburn	Compression Connectors CTK 1 CTK 2 CTK 3
Raychem	Compression Connectors CTE-300-00 CTE-400-00 CTE-500-00 Standard Split Bolt CTE-300-00 CTE-400-00

U fz-1  
July 1987

U fz - Transformer Connector Block, Insulated  
Multiple Cable Connectors

Watertight - For use in all locations.

Manufacturer	Connection Type	Catalog Number
Blackburn	Lug	SCU, with lugs and sleeves
Burndy	Lug	Stud Mole with sealing sleeve
Utilco	Set Screw	PTF-SS, Watertight Insulated transformer Connector block
<u>Non-Watertight - For use in above grade locations only</u>		
Alcoa	Lug	Interchange 1 ABBD Series (Disconnectable) Use with A9 insulating boots
Alcan	Set Screw	VBTT Series with double sealing sleeve
Connector Mfg. Co.	Set Screw	Uni-Joint Bar Connectors, Series NSC, NDS-C, RLS, SDS-C (Permanent)
	Set Screw	Uni-Joint Bar Connectors, Series NSSC, NDQ-C, RLSS, SDQ-C (Disconnectable)
Electrical Spec. Prod.	Lug	Type SU (Permanent)
	Lug	Types SUR and RDSR(Removable) (With Types LA and A1 lugs and Sleeve kits)
	Set Screw	Type UPS-I (Permanent)
Fargo	Bolted	Type UPM-I (Disconnectable)
Homac	Set Screw	GUC Series
	Lug	GUS-200S Series
	Lug	DF Series
Blackburn	Set Screw	FTU 125 Series(Disconnectable) with flood seal sleeve kit
	Set Screw	LRT Series
Penn Union	Set Screw	TSB-J58C (Permanent)
	Lug	TSB-D58C (Disconnectable)
	Lug	Type DBAT (Permanent)
Reliable	Set Screw	Type DBAT-LH (Disconnectable)
Utilco	Set Screw	Use with Series DBTB, DBTBF and DBTH lug and Sleeves kits
	Set Screw	15912-REA (Disconnectable)
	Set Screw	PTF-IN (Permanent)
	Set Screw	PTF-CJU (Disconnectable)

Note: Additional insulation may be required with some of the above-listed secondary terminal blocks due to the irregularity of mating surfaces between various secondary studs being supplied by the transformer manufacturers.

U fz-2  
July 1987

U fz - Transformer Connector Block, Insulated

Single Cable Connectors

Non-Watertight - For use in above grade locations only

Manufacturer

Electrical Specialty Products

Catalog Number

Type SM transformer bushing connector kit. (Stud to aluminum cables through 350 kcmil)

NOTE: Additional insulation may be required with some of the above-listed secondary terminal blocks due to the irregularity of mating surfaces between various secondary studs being supplied by the transformer manufacturers.

U gc  
July 1987

<u>Manufacturer</u>	<u>U gc - Shield, cable riser Dia. (Inches) Galvanized Steel</u>	<u>Length (Feet)</u>
Chance	2 - 3 - 3-1/2	5 - 9
*Electrical Materials	2 - 3 - 4 - 5	5
*#Fargo	2 - 3 - 3-3/4 - 5	5 - 8 - 10
*Joslyn	2 - 3 - 3-1/2	5 - 8
*McGraw-Edison	2 - 3 - 4	3 - 5 - 10
Midland-Ross (Kindorf Snapduct)	2 1/2 - 3 1/2 - 5 (14 ga. galv. steel)	2 1/2 - 5 - 10
#Utility Products Co.	3/4 - 1 - 2 - 3 - 3-3/4	3 - 5 - 8

Plastic and Fiberglass

Custom Plastics	2 - 3 - 4 - 5	5 - 10
*Electrical Materials (plastic)	2 - 3 - 4 - 5	5 - 10
*Hercules (Haskon) (plastic) (Power Mold, I, II, III)	2 - 3 - 4 - 5	5 - 9 - 10
*Joslyn (plastic)	2 - 3 - 4 - 5	5 - 10
*Nordic (fiberglass)	2 - 3 - 5	5 - 10
*Quazite Corporation (Composolite - plastic)	2 - 3 - 4 - 5	10

(Order by size and length)

#All sizes available with galvanized finish or painted-over galvanizing.

\*All sizes available with back plate.

U gk-1  
July 1987

U gk - Terminations, Indoor

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

<u>Manufacturer</u>	<u>Catalog No.</u>
<u>Bishop</u>	Stress-Wrap (15, 25 & 35 kV)
<u>Blackburn</u>	Type SKD Stress Cone (15, 25 & 35 kV)
<u>Elastimold (ESNA)</u>	Style 35-MSC (15, 25 & 35 kV)
<u>General Electric</u>	Termi-Matic, Type A or G (15, 25 & 35 kV)
<u>Joslyn</u>	J9275 (15 kV)
<u>3M</u>	Quick Term II Series (15, 25 & 35 kV)
<u>Raychem</u>	Thermofit HVT (15, 25 & 35 kV)
<u>RTE</u>	Fasterm Stress Cone (15 & 25 kV)
<u>Sigmaform</u>	Q-Cap Series STK-I (15 & 25 kV)

U gk-2  
July 1987

U gk - Terminations, outdoor  
(with mounting hardware)\*

(when ordering, specify conductor size, type whether copper or aluminum, insulation diameter, and type of mounting desired.)

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>Blackburn</u>	Type MT (15, 25 and 35 kV)
<u>Elastimold (ESNA)</u>	Style 16-THG (15 and 25 kV) Style 35-MT (35 kV)
<u>General Electric</u>	Termi-Matic, Type G (15, 25 and 35 kV)
<u>Joslyn</u>	"Easy-On II" (15, 25 and 35 kV)
<u>3M</u>	5900 Series 15 kV (4/0 AWG and larger) 25 kV (#2 AWG thru 750 kcmil) "Quick-Term" 5800 Series bracket mounted, 15 kV (#2 AWG thru 3/0 AWG) MT Series 15 kV (4/0 AWG and larger) 25 kV, 35 kV "Quick-Term II" Series (15, 25 and 35 kV)

\*Mounting hardware is used to attach termination to mounting bracket (U hd or U hj).

U gk-2.1  
July 1987

**U gk - Terminations, Outdoor  
(With Mounting Hardware)\***

(When ordering specify conductor size, type, whether  
copper or aluminum, insulation diameter, and type  
of mounting desired)

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>Bishop</u>	SWO Kit (15, 25 and 35 kV)
<u>G &amp; W</u>	"Eliminator" 15 kV, E 25 kV, E 35 kV, E
<u>Raychem</u>	Thermofit HVT (15, 25 and 35 kV)
<u>RTE</u>	Fasterm Series (15 & 25 kV)
<u>Sigmaform</u>	Q-Cap Series STK (15 & 25 kV)

\*Mounting Hardware is used to attach termination to mounting bracket (U hd or U hj).

U gn-1  
July 1987

U gn - Enclosures, equipment

Applicable Specifications: "REA Specifications for Equipment Enclosures,"  
U-4

<u>Manufacturer</u>	<u>Catalog No.</u>
<u>Durham</u>	Series 4242 (dead-front) Series 5454 (dead-front) Series 3452 (dead-front)
<u>Electrical Equipment</u>	TH1-DF Series (dead-front)
<u>Elliott</u>	EPM-PTS (dead-front)
<u>Inter-alloys</u>	3636-DF-SP 4242-DF-SP 5454-DF-SP 6666-DF-SP 7272-DF-SP
<u>Malton Electric</u>	1-Phase Single Unit (dead-front)
<u>Maysteel</u>	E/L100 (dead-front)
<u>Western Power Products</u>	FG-DF1 (dead-front) FG-DF3 (dead-front)

NOTE: The above enclosures are available with various multipoint terminations. The owner should specify termination points to be provided.

U gn-2  
July 1987

U gn - Enclosures, Equipment

Sectionalizing Enclosures

<u>Manufacturer</u>	<u>Catalog No.</u>
<u>Carolina Dielectrics</u>	Model 0501
<u>Durham</u>	Mini-Section Low Profile I, Low Profile III, and Tri- Section Series
<u>Electrical Equipment</u>	LPT-228-P LPT-249-P 30 LPT-266-P 30
<u>Maysteel</u>	CW200 Series CW300 Series
<u>Nordic</u>	ND Series
<u>Western Power Products</u>	Model 24-1 Model 34-2 Model SPM-320 10 Model SPM-540 30
<u>Shallbetter</u>	SPMS Series (dead-front)
<u>Willow</u>	WHC Series WRC Series

NOTE: The above enclosures are available with various multipoint terminations. The owner should specify termination points to be provided.

U gn-2.1  
July 1987

U gn - Enclosures, equipment

Sectionalizing Enclosures

<u>Manufacturer</u>	<u>Catalog No.</u>
<u>Malton Electric</u>	MEJ Series ME Series MEH Series
<u>Vertex Plastics</u>	1826B, 10 1826C, 10 1881, 30
<u>Inter-Alloys</u>	15 kV and 25 kV Primary terminal pedestals PP Series, 10 and 30 *PP-PM Series, 10 and 30
<u>Galva-Closure Products</u>	Series AG Series BB
<u>Hoffman</u>	U-J Series junction enclosures U-JGS Series ground sleeves
<u>Utility Products Co.</u>	PPB (15 & 25 kV)
<u>Wheelock and Son</u>	Single phase and three phase

\*For pole mounting

\*\*For crossarm mounting

U gn-3  
July 1987

U gn - Enclosures, Equipment

Manufacturer

Catalog No.

Highline

HL80P-15 (15 kV)

HL81P-15 (15 kV)

HL90P (15 kV)

Sectionalizing Enclosures

Ranger

TE-501, TE-503, J-34-TB

RTE

SECTER Series 400L (10)

SECTER Series 450L (30)

Burial Type

Sonoco Products Co.

36" Duropipe (fiber)  
transformer vault. Available  
with stainless steel clevises,  
angle or tab ring, protective  
shields and cast iron or welded  
steel grates.

U go  
July 1987

U go - Fault Indicator  
(For Construction Unit UM6-4)

Manufacturer

Edison Control Corporation

Type

Series EC100 (single phase)  
Series EC300 (three phase)  
Available with mounting kit KT5002

Fisher Pierce

Series 1514  
(To be used on single-phase  
circuits only)

McGraw-Edison

Linam

RTE

TPR, LV, MR

U gp - Connector Blocks and Splices, Secondary

Watertight - For Use In All Locations

<u>Manufacturer</u>	<u>Connection Type</u>	<u>Catalog Number</u>
Alcoa	Lug	Interchange-I, ABB Series Use with A-9 insulating boots
Alcan	Set Screw	VPB Series
AMP	Compression	600 Volts secondary UG Distribution 4-way and 6-way bus system
Blackburn	Lug Set Screw	Series UP(with lugs and sleeves) Series UB(1000 amp bus with sleeves)
Burndy	Lug	URD Mole
Connector Mfg. Co.	Compression Set Screw	Utilug Sure Seal Splice Kits, Series SSK, SSKL Uni-Joint Sure Seal Series SSBC
Electrical Spec. Products	Lug Set Screw	Type UC (8 AWG - 500 kcmil) (with LA lug and sleeve) Type UB (with sleeve) splice Type ACL-HSH (6 AWG - 500 kcmil)
Fargo	Set Screw	GU-500 Series
Homac	Lug Lug Set Screw Set Screw	FS-95 Series with flood seal sleeve kit (8AWG - 350 kcmil) FS-125 Series with flood seal sleeve kit (350 - 500 kcmil) SHC Series RAB Series
Kearney	Compression Compression	HCR HAR
Penn Union	Lug	DBA Series with DBTB, DBTBF and DBTH Series lug and sleeve kits
Reliable	Set Screw	15903-15908, 15910 with sleeve kit (4 AWG - 350 kcmil) 15911 with sleeve kit (500 - 750 kcmil)
Utilco	Set Screw	Safety Sub Splice - USPA-350SS

U gp-2  
July 1987

U gp - Connector Blocks and Splices, Secondary

<u>Manufacturer</u>	<u>Non-Watertight - For Use In Above-Grade Pedestals Only</u>	<u>Connection Type</u>	<u>Catalog Number</u>
Blackburn		Set Screw	Type PSB-C
Connector Mfg. Co.		Set Screw	Uni-Joint Series NCA
Electrical Spec. Prod.		Set Screw	UPC Series
Fargo		Set Screw	GUS-200 Series
Homac		Set Screw Set Screw	CLR-350 Series PVAB Series
Utilco		Set Screw	PED-350-IN Series

U gg  
July 1987

U gg - Boot or sleeve, insulated\*

<u>Manufacturer</u>	<u>Catalog Number</u>
Blackburn	MPC9 MPC15
Electrical Materials	100-B (For pad-mounted transformer spade terminals)

\*Use restricted to 120/208 volt 500 kVA transformers and larger not equipped with threaded studs.

U gu-1  
July 1987

U gu - Pedestal, Power

Refer to Construction Drawings UK5 and UM5-5

Applicable Specifications: "REA Specifications for Secondary Power Pedestals," U-6

<u>Manufacturer</u>	<u>Inside Dimensions</u> <u>Inches</u>	<u>Height</u> <u>Inches</u>	<u>Catalog No.</u>
Coil Sales (Charles Industries)	8.25 Dia	31-1/2	CPLP-8
	8.25 Dia	31-1/2	CPLP-8I(Integral Stake)
	10.75 Dia	31-1/2	CPLP-10
	10.75 Dia	31-1/2	CPLP-10I(Integral Stake)
Fargo	8 x 8	38	UP-1520C
	8 x 8	44	UP-1620C
	8 x 12	27	UP-1720C
	8 x 12	44	UP-1820C
	10 x 10	27	UP-2320C
	10 x 10	38	UP-2220C
	10 x 10	43	UP-2420C
	10 x 16	37	UP-2520C
Inter-Alloys	7.75 x 11	24	C-24128-PH
	7.75 x 15	24	C-24168-PH
	7.75 x 11.5	24	**PM-24128-PH
	7.75 x 15.5	24	**PM-24168-PH
Nordic	8 x 8	44	PR-50, PR-55
	9 x 14	30	PR-149 (stake) PR-150 (stakeless)

\*Furnished with stake.

\*\*Pole mounted

U gu-1.1  
July 1987

U gu - Pedestal, Power

Refer to Construction Drawings UK5 and UMS-5

Applicable Specifications: "REA Specifications for Secondary Power Pedestals," U-6

<u>Manufacturer</u>	<u>Inside Dimensions Inches</u>	<u>Height Inches</u>	<u>Catalog No.</u>
Shallbetter	7.5 x 10.25	39	SUTP Series
Utility Products	8 x 8	38	UP 8HLP
	8 x 8	46	UP 8HP
	10-1/2 x 10-1/2	26	UP 10HLP
	16-1/2 x 10-1/2	36	UP 1016HLP
	10-1/2 x 10-1/2	42	UP 10HP
Vertex	8 x 14	30	SP 814
Western Power	8 x 8	30	*SP-8, DF-3 (dead-front)
	9 x 9	30	*SPMC-9-DF3
	9 x 9	30	SPM-90, DF-3 (stakeless)
	9 x 14	30	*SPMC-14-DF3
	9 x 14	30	SPM-140, DF-3 (stakeless)

\*Furnished with stake.

\*\*Pole mounted

U gu-2  
July 1987

U gu - Power Pedestal  
Refer to Drawings UK6 and UM5-5

Applicable Specifications: "REA Specifications for Secondary Power Pedestals," U-6

Manufacturer

Catalog No.

Armorcast

Molded polyethylene with plastic cover  
6001 Series

Associated Plastics

Molded polyethylene with  
galvanized steel or plastic cover  
Catalog Nos. 1730-1, 3; 1324-1, 3

Blackburn

Molded polyethylene with  
galvanized steel cover and  
ground lug.  
Catalog No. SDR-2PG

Burndy

Molded polyethylene with  
galvanized steel cover.  
Catalog No. URD20G23

Carson

Molded polyethylene with plastic cover  
Catalog No. 1324-12B and 1730-12B

CDR Series (Homac)

Fiber reinforced polymer concrete  
PA Series with penta-head bolts

U gu-2.1  
July 1987

U gu - Power Pedestal  
Refer to Drawings UK6 and UM5-5

Applicable Specifications: "REA Specifications for Secondary Power Pedestals," U-6

<u>Manufacturer</u>	<u>Catalog No.</u>
<u>Dexol</u>	HDPE, DX-101 DX-102 ABS, DX-101HD DX-102HD
<u>Fargo</u>	HDPE, B-100R Series ABS, B-200R Series
<u>Highline</u>	HL50AE HL51
<u>Mo. Ped.</u>	Molded high density polyethylene with HDPE cover, Model No. 186
<u>Pen-Cell</u>	Molded polyethylene with galvanized steel or plastic cover Catalog No. PE-20-REA Polycarbonate Box cover Catalog No. AG-20-6-REA

U gv  
July 1987

U gv - Stake, Power Pedestal  
Refer to Construction Drawing UK5

<u>Manufacturer</u>	<u>Length Inches</u>	<u>Catalog No.</u>	
		<u>For Power Pedestal Only</u>	<u>For Joint Pedestal</u>
Fargo	42-60-72-78	UP-530S Series	UP-530J Series
Nordic	48-60-72	PM Series	
Utility Prod.	72-78-84	DM Series	DM Series

U hb - Cable Accessories  
(When ordering specify conductor size, type whether  
copper or aluminum and insulation diameter)

(Items on this page are rated for operation on three-phase systems  
and may be used on single-phase systems.)

200 Ampere Continuous Current Rating

<u>Manufacturer</u>	<u>Catalog No.</u>
<u>Blackburn</u>	15 kV, used with loadbreak connectors Type ABOC insulating cap Type JLB2BA bushing plug
<u>Elastimold (ESNA)</u>	15 kV, used with loadbreak connectors Style 1601-CL cable lead Style 1602A3R feed thru insert Style 1601-A3R bushing plug Style 160-DR insulating cap
	25 kV, used with loadbreak connectors Style 2701-A2 bushing plug Style 270-DR deadend receptacle
	35 kV, used with loadbreak connectors Style 3701A-3 bushing plug* Style 370DR(G) insulating cap
<u>General Electric</u>	15 kV, used with loadbreak connectors Switch module 9U02AAB001 Basic connector module 9U05 Series Insulating cap 9U01AEW400 Feed-through insert 9U04AEB001
	25 kV, used with loadbreak connector switch module 9U02BAB001 Insulating cap 9U01BEW500 Feed-through insert 9U04BEB001)

### U hb - Cable Accessories

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

(Items on this page are rated for operation on three-phase systems and may be used on single-phase systems.)

<u>Manufacturer</u>	<u>Catalog Number</u>
Joslyn	15 kV, used with loadbreak connectors Type LBIC152 Insulating Cap
	25 kV, used with loadbreak connectors Type LBIC252 Insulating Cap
RTE	15 kV, used with loadbreak connectors No. 2603711A12M protective cap No. 2604797B01M bushing well insert No. 2637345A01M two-way bushing well insert No. 2604231B01 bushing well plug 25 kV, used with loadbreak connectors No. 2606591A02M protective cap No. 2604982B01M bushing well insert No. 2637157B01M two-way bushing well insert No. 2604231B01 bushing well plug 35 kV, used with loadbreak connectors No. 2637592B03M protective cap

U hb-2  
July 1987

U hb - Cable Accessories

(When ordering, specify conductor size, type, whether copper or aluminum and insulation diameter)

600 Ampere Continuous Current Rating

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>Elastimold (ESNA)</u>	15 kV, used with non-loadbreak connectors 600, 650 Series 25 kV, used with non-loadbreak connectors K600, K650 Series 35 kV, used with non-loadbreak connectors 750LR Series
<u>RTE</u>	15 kV VTB Tee connectors, No. 2604360B Series Deadbreak termination system-T61 Series- optional 200 A. loadbreak tap 25 kV Deadbreak termination system-T62 Series- optional 200A. loadbreak tap 35 kV Deadbreak termination system-T63 Series- optional 200 A. loadbreak tap
<u>Blackburn</u>	15 kV, used with non-loadbreak connectors Types 6B and 65B 25 kV, used with non-loadbreak connectors Types 6C and 65C
<u>Joslyn</u>	15 kV, used with non-loadbreak connectors PES86/PSS86 25 kV, used with non-loadbreak connectors PES86--S/PSS86--S

Conditional List

U hb(1)

July 1987

U hb - Cable Accessories

(When ordering specify insulation diameter)

Concentric Neutral Clamps (Bonding)

<u>Manufacturer</u> <u>Conditions</u>	<u>Meeting No. and Date</u>	
Reliable Concentric neutral bonding clamp (Nos. 2329 & 2330)	1037 (3/21/74)	<ol style="list-style-type: none"><li>1. To obtain experience</li><li>2. Only for bonding of anodes or other metals to the neutrals of existing cable installations.</li><li>3. Not to be used to connect neutral to grounding electrodes</li></ol>
Harco URD cable clamp	1114 (5/12/77)	Same as above

Conditional List  
U hb(2)  
July 1987

U hb - Jacketed Cable Restoration Kits  
(For restoring jacket after installation of  
splices in jacketed underground cable.)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Elastimold PCS-1 Power Cable Seal	1341 (5/14/87)	To obtain experience.

U hc  
July 1987

U hc - Cable Supports  
15 and 25 kV

<u>Manufacturer</u>	<u>Catalog Number</u>	<u>Grip Dia. Range (inches)</u>
Kellums	022-16-011	0.81 to 0.94
	022-16-012	0.87 to 1.00
	022-16-013	0.94 to 1.06
	022-16-014	1.00 to 1.18
	022-16-015	1.06 to 1.25
Lewis	022-01-018	1.25 to 1.50
	A-U-SW-18	0.75 to 1.25
Economy Cable Grip	U-1.12	1.12 to 1.62
	SPJ087-U	0.87 to 1.00
	SPJ100-U	1.00 to 1.12
	SPJ113-U	1.12 to 1.25
Fargo	SPC125-S-U	1.25 to 1.50
	GJ-854	0.718 to 0.919
	GJ-855	0.920 to 1.12
Aluma-Form	GJ-856	1.12 to 1.50
	CS-800 Series	0.75 to 2.0
Woodhead	35032 (SC075-U)	0.75 to 0.99
	35033 (SC100-U)	1.00 to 1.24
	35034 (SC125-U)	1.25 to 1.50
Slater	FCSD 14	0.82 to 0.95
	FCSD 15	0.88 to 1.00
	FCSD 16	0.95 to 1.06
	FCSD 17	1.01 to 1.19
	FCSD 18	1.07 to 1.26
	FC125-U	1.25 to 1.50

U hd  
July 1987

U hd - Brackets, pothead mounting and  
Brackets, combination pothead and  
arrester mounting

<u>Manufacturer</u>	<u>Single Phase</u>	<u>Three Phase</u>
Aluma-Form	TB-EMB-1-2PA	TB-EMB-1-6PA

U he-1  
July 1987

U he - Enclosures, Sectionalizing Equipment

12.5/7.2 kV

Manufacturer

Durham

Catalog Number

Model FTSP-CL, single phase pad-mounted  
1 thru 4 fused taps  
Model FTSP-CL3, three-phase pad-mounted  
1 and 2 fused taps

Electrical Equipment

FTDF-P Series, single and three-phase  
one and two fused taps, pad-mounted  
\*GGCL-P Series, single and three-phase,  
pad-mounted

Elliott

Type EPMR, single and three-phase,  
pad-mounted

Powercon

Type PMF, single-phase, pad-mounted  
Type PMF-8.3, three-phase, pad-mounted

Inter-Alloys

Uni-Versal single- and three-phase pad-mount  
fusible switchgear and loadbreak switches,  
Series UV-FL

\*Furnished with current limiting fuses.

NOTE 1: Enclosures on this page must comply with the dead-front requirements  
of REA Spec. U-4.

NOTE 2: Single-pole switching of three-phase underground circuits may cause  
ferroresonance. Refer to REA Bulletin 61-3.

U he-1.1  
July 1987

U he - Enclosures, Sectionalizing Equipment

12.5/7.2 kV

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>G &amp; W</u>	PLDR, PFLDR (submersible and pad-mounted) single-phase and three-phase, fused or unfused switchgear. (Choice of deep well or deadbreak bushings), (Must specify pentahead security bolt when ordering)
<u>Malton</u>	MEF21
<u>McGraw-Edison</u>	EH3A Series, single-phase, pad-mounted
<u>S &amp; C</u>	Mark III, Models PMS (with option G-7) 200 ampere three-pole switching and 200 ampere single-pole switching
<u>Shallbetter</u>	SPMD Series, single and three-phase, pad-mounted SPMC Series, 200 ampere single-pole switching
<u>Westinghouse</u>	UTE, PAD-PAK pad-mounted switching device, single and three-phase, 300 amp

NOTE 1: Enclosures on this page must comply with the deadfront requirements of REA Spec. U-4.

NOTE 2: Single-pole switching of three-phase underground circuits may cause ferroresonance. refer to REA Bulletin 61-3.

U he-2  
July 1987

U he - Enclosures, Sectionalizing Equipment

24.9/14.4 kV

<u>Manufacturer</u>	<u>Catalog Number</u>
Elliott	Type EPMR, single- and three-phase, pad-mounted
G & W	PLDR, PFLDR (submersible and pad-mounted) single-phase and three-phase, fused or unfused switchgear (Choice of deep well or deadbreak bushings), (Must specify pentahead security bolt when ordering)
Inter-Alloys	Uni-Versal single- and three-phase pad-mount fusible switchgear and loadbreak switches, Series UV-FL
Powercon	Type PMF, single-phase pad-mounted Type PMF, three-phase pad-mounted

NOTE 1: Enclosures on this page must comply with the dead-front requirements of REA Specification U-4.

NOTE 2: Single-pole switching of three-phase underground circuits may cause ferroresonance. Refer to REA Bulletin 61-3.

U he - Enclosures, Sectionalizing Equipment

24.9/14.4 kV

Manufacturer

RTE

Catalog Number

Type LBS, single- and three-phase, pad-mounted, 300 amp  
FuseTER Series, single-phase and three-phase

Shallbetter

SPMD Series, single and three-phase,  
pad-mounted

Westinghouse

UTE, PAD-PAK pad-mounted switching device,  
single and three-phase, 200 amp

NOTE 1: Enclosures on this page must comply with the deadfront requirements of REA Specification U-4.

NOTE 2: Single-pole switching of three-phase underground circuits may cause ferroresonance. Refer to REA Bulletin 61-3.

U he-3  
July 1987

U he - Enclosures, Sectionalizing Equipment  
(600 amp)

<u>Manufacturer</u>	<u>Catalog Number</u>
Chance	Type LVS (submersible and pad-mounted) single-phase and three-phase, vacuum switching equipment, fused or unfused, 200 or 600 amp, 15-25 kV
Electrical Equipment	Type PSI, 15 kV, 25 kV, 600 amp., three-phase switching, and 200 amp., single-phase switching. (When ordering, add suffix B-3)
Elliott	Type EPMR, Single and three-phase, pad-mounted, 25 kV
General Electric	Series PSB (pad-mounted) and SSB (submersible) three-phase switching equipment, 200 or 600 amp., 15 or 27 kV
Kearney	Series VE - pad-mounted, 15 kV and 25 kV, single-phase and three-phase vacuum switching, fused or unfused, 200 or 600 amps Series VP - submersible, single-phase and three-phase, vacuum switching, 200 or 600 amp, 15 and 25 kV, with or without VACOP remote operator

NOTE 1: Enclosures on this page must comply with the deadfront requirements  
of REA Specification U-4.

NOTE 2: Single-phase switching of three-phase underground circuits may cause  
ferroresonance. Refer to REA Bulletin 61-3.

U he - Enclosures, Sectionalizing Equipment

(600 amp.)

Manufacturer

Joslyn

Catalog Number

Type SG6 (submersible) three-phase switching equipment, 600 amp., 15 or 25 kV

RTE

Type LBS, single- and three-phase, pad-mounted 15 kV

Type R-VAC, three-phase vacuum switchgear, 15-25 kV

S & C

Mark III, Model PMH (with option G-7), 15-25 kV, 600 amp., three-phase switching and 200 amp., single-pole switching

Model PME-15-25 kV, Fully enclosed live parts at all times, three-phase switching and 200 amp single pole switching

Trayer

800 Series, pad mounted three-phase vacuum switching equipment, 200 and 600 amp., 15-25 kV with or without fusing

501 submersible vacuum fuse enclosure, deadfront 200 or 600 amp., 15-25 kV

Type SSA (submersible, fused and unfused) 200 and 600 amp., 15-25 kV

Note 1: Enclosures on this page must comply with the deadfront requirements of REA Spec. U-4.

Note 2: Single-pole switching of three-phase underground circuits may cause ferroresonance. Refer to REA Bulletin 61-3.

U hg  
July 1987

U hg - Anti-tamper Shield

<u>Manufacturer</u>	<u>Catalog Number</u>
Formed Plastics	7262 Series
McGraw-Edison	UM8Y1
Sonoco	S24 Series

U hj  
July 1987

U hj - Bracket, combination arrester,  
cutout and pothead mounting

Applicable Drawing: UM2, UM2A, UM2-4

<u>Manufacturer</u>	<u>Single Phase</u>	<u>Three-Phase</u>
Aluma-Form	1HCA-18-1PB Series	---
McGraw-Edison	DC51B1	DC52B1

U hp-1  
July 1987

U hp - Terminations, Elbow  
(rated for switching on three-phase systems)

(When ordering, specify conductor size, type, whether  
copper or aluminum and insulation diameter)

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>RTE</u>	15 kV, Loadbreak SBT IV 2604600B Series with test point 2604599B Series without test point 25 kV, Loadbreak SBT 2604740B Series with test point 2604741B Series without test point
<u>Elastimold (ESNA)</u>	15 kV loadbreak Style 165LR, without voltage test point Style 166LR, with voltage test point Style 167LR, without voltage test point Style 168LR, with voltage test point 25 kV loadbreak Style 271LR, without voltage test point Style 272LR, with voltage test point Style 273LR, without voltage test point Style 274LR, with voltage test point 35 kV loadbreak Style 375LR, without voltage test point Style 376LR, with voltage test point
<u>General Electric</u>	15 kV, Loadbreak 9U01A--4--Series 25 kV, Loadbreak 9U01B--5--Series

U hp - Terminations, Elbow  
(rated for switching on three-phase systems)

(When ordering, specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer

Catalog Number

Blackburn

15 kV, Loadbreak  
JT2B (without test point)  
JT2BT (with test point)  
25 kV Loadbreak  
JT2C (without test point)  
JT2CT (with test point)

Joslyn

15 kV, Loadbreak  
LBT112M (without test point)  
LBT112TM (with test point)  
25 kV, Loadbreak  
LBT262M (without test point)  
LBT262TM (with test point)  
15 kV, Fused Loadbreak  
SPF-T (with test point)

Conditional List

U hp

July 1987

U hp - Elbow Sealing Kits  
(For resealing jacket after installation of  
elbow termination on jacketed underground cable)

(When ordering, specify diameter of cable over jacket)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
3M 8500 Series, Cold Shrink	1336 (2/26/87)	To obtain experience.

U hq-1  
July 1987

U hq - Terminations, Multipoint

(Items on this page are rated for operation on three-phase systems  
and may be used on single-phase systems.)

(When ordering specify conductor size, type, whether  
copper or aluminum and insulation diameter)

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>Elastimold (ESNA)</u>	<p>15 kV 2-way bushing, 163J2 3-way bushing, 163J3 4-way bushing, 163J4</p> <p>25 kV 2-way bushing, 271J2 3-way bushing, 271J3 4-way bushing, 271J4</p> <p>35 kV 2-way bushing, 373J2 3-way bushing, 373J3 4-way bushing, 373J4</p>
<u>RTE</u>	<p>15 kV 2-way, 3-way, &amp; 4-way bushings Series 2637172B with mounting bracket Series 2637164C without mounting bracket</p> <p>25 kV 2-way, 3-way, &amp; 4-way bushings Series 2637160B with mounting bracket Series 2637166C without mounting bracket</p>
<u>General Electric</u>	<p>15 kV 2-way bushing 9U07A--2-0 3-way bushing 9U07A--3-0 4-way bushing 9U07A--4-0</p> <p>25 kV 2-way bushing 9U07B--2-0 3-way bushing 9U07B--3-0 4-way bushing 9U07B--4-0</p>
<u>Blackburn</u>	JJ2B10 (2, 3, 4-way) 15 kV

U hq-2  
July 1987

U hq - Terminations, Feed-Through and Parking Bushings

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>Blackburn</u>	15 kV Feed-through, JFT2B10 Parking Bushing, J2PB
<u>Elastimold (ESNA)</u>	35 kV Feed-thru, 373FT Parking Bushing, 371SOP
<u>General Electric</u>	15 kV Feed-through, 9U07AKF200 Insulated Parking Bushing, 9U07ACF100 Grounded Parking Bushing, 9U07AAF100 25 kV Feed-through, 9U07BCF200 Insulated Parking Bushing, 9U07BCF100 Grounded Parking Bushing, 9U07BAF100

U hr  
July 1987

U hr - Secondary tap or splice cover, submersible

<u>Manufacturer</u>	<u>Type or Catalog No.</u>
Bishop	Splice-Wrap
Blackburn	Type WDBS (#2 through #4/0) Type DBS (250 KCMIL through 1000 KCMIL)
Connector Mfg. Co.	Utilug Sure Seal
Elastimold (ESNA)	Style 86
Electrical Spec. Prod.	TSC Series
Homac	FSS Series
Kearney	Aqua-Seal Kit
3M	PST Series 8400

Heat Shrink Tubing (with sealant throughout)

<u>Manufacturer</u>	<u>Type or Catalog No.</u>
AMP	Black heat-shrink tubing
Blackburn	HS cable sleeves
Electrical Spec. Prod.	HSH
3M	ITCSN tubular cable sleeve ICRS wraparound cable sleeve
Panduit	Heat shrink insulating cover
Raychem	WCS cable sleeves
Sigmaform Corporation	Sigmaform heat-shrinkable products

U hv-1  
July 1987

U hv - Cable, Underground  
15 KV Cable

Applicable Specification: REA Specification U-1  
Conductor: Copper or Aluminum - #2 AWG through 1000 kcmil  
Insulation: Crosslinked (XL) Polyethylene, Ethylene Propylene Rubber (EPR), Crosslinked Polyethylene with Tree-retardant additives (XL-TR), or High Molecular Weight Polyethylene with Tree-retardant additives (HMW-TR)  
Neutral: Copper Concentric Neutral  
Jacket (If Used): High Molecular Weight Polyethylene

<u>Manufacturer</u>	<u>Insulation(s)</u>	<u>Jacketed Cable Accepted*</u>	<u>Flat Strap Neutral Available</u>	<u>Stabilized Neutral Design**</u>
Cablec	XL, EPR, XL-TR, HMW-TR	Yes	Yes	R-LOK
Conductor Prod.	XL, XL-TR, HMW-TR	Yes	Yes	Ridg-lok
Hendrix	XL, EPR, XL-TR, HMW-TR	Yes	No	Neu-lok
Okonite	XL, EPR, XL-TR	Yes	Yes	
Pirelli	XL, EPR, XL-TR	Yes	Yes	STA-SERVE
Reynolds	XL, EPR, XL-TR	Yes	Yes	Secure-Neutral
Rockbestos	XL-TR	No	No	
Rome	XL, EPR, XL-TR	No	Yes	Serve-Lock Counter Secure
Southwire Furukawa	XL, XL-TR	Yes	No	

\*For grounding purposes insulated jacketed cables must be treated like overhead lines, i.e., at least four ground rods must be installed per mile in accordance with the NESC. (This does not include service grounds, etc., but does include equipment grounds.) Additional grounding may be necessary in soils with higher resistivity. In splices or tap connections, a good seal should be achieved to exclude moisture. It is recommended that any place that the jacketing is cut (including the connections to ground rods), it be done above ground in a pedestal.

\*\*Accepted design meeting the requirements of paragraph 7.5.2. of REA Specification U-1, for a minimum neutral with a maximum lay.

U hv - Cable, Underground  
25 kV Cable

Applicable Specification: REA Specification U-1  
 Conductor: Copper or Aluminum - #1 AWG through 1000 kcmil  
 Insulation: Crosslinked (XL) Polyethylene, Ethylene  
                  Propylene Rubber (EPR), Crosslinked Polyethylene  
                  with Tree-retardant additives (XL-TR), or High  
                  Molecular Weight Polyethylene with Tree-retardant  
                  additives (HMW-TR)  
 Neutral: Copper Concentric Neutral  
 Jacket (If Used): High Molecular Weight Polyethylene

<u>Manufacturer</u>	<u>Insulation(s)</u>	<u>Jacketed Cable Accepted*</u>	<u>Flat Strap Neutral Available</u>	<u>Stabilized Neutral Design**</u>
Cablec	XL, EPR, XL-TR, HMW-TR	Yes	Yes	R-LOK
Conductor Prod.	XL, XL-TR, HMW-TR	Yes	Yes	Ridg-lok
Hendrix	XL, EPR, XL-TR, HMW-TR	Yes	No	Neu-lok
Okonite	XL, EPR, XL-TR	Yes	Yes	
Pirelli	XL, EPR, XL-TR	Yes	Yes	STA-SERVE
Reynolds	XL, EPR, XL-TR	Yes	Yes	Secure-Neutral
Rockbestos	XL-TR	No	No	
Rome	XL, EPR, XL-TR	No	Yes	Serve-Lock Counter Secure
Southwire Furukawa	XL, XL-TR	Yes	No	

\*For grounding purposes insulated jacketed cables must be treated like overhead lines, i.e., at least four ground rods must be installed per mile in accordance with the NESCA. (This does not include service grounds, etc., but does include equipment grounds.) Additional grounding may be necessary in soils with higher resistivity. In splices or tap connections, a good seal should be achieved to exclude moisture. It is recommended that any place that the jacketing is cut (including the connections to ground rods), it be done above ground in a pedestal.

\*\*Accepted design meeting the requirements of paragraph 7.5.2. of REA Specification U-1, for a minimum neutral with a maximum lay.

U hv-3  
July 1987

U hv - Cable, Underground

600 Volt Cable

Applicable Specification: REA Specification U-2  
Conductor : Copper, #4 AWG and larger  
              Aluminum, #2 AWG and larger  
Insulation : Cross-Linked polyethylene (XLPE)

<u>Manufacturer</u>	<u>Type Conductor</u>
Alcan	Copper or Aluminum
Cablec	Copper or Aluminum
Collyer	Copper or Aluminum
Conductor Products	Aluminum
Essex	Copper or Aluminum
General Electric	Copper or Aluminum
Hatfield	Copper
Kaiser	Aluminum
Okonite	Copper or Aluminum
Phelps Dodge	Copper or Aluminum
Phillips Cables, Inc. (Marked "Phillips W")	Copper or Aluminum
Pirelli	Copper or Aluminum
Reynolds	Copper or Aluminum
Rome Cable	Copper or Aluminum
Southwire	Copper or Aluminum

NOTE: The manufacturers shown above have indicated that their 600 volt cable  
is suitable for use on 480 volt corner grounded delta circuits.

The above cable may be supplied with UL label for Type USE.

U hv - Cable, Underground

600 Volt Multi-Conductor Cable

Applicable Specification: REA Specification U-2  
Conductor : Copper, #4 AWG and larger  
              : Aluminum, #2 AWG and larger  
Insulation : Cross-Linked polyethylene (XLPE)  
Cable Configuration : 3 Insulated Conductors Triplexed

<u>Manufacturer</u>	<u>Type Conductor</u>
Alcan	Copper or Aluminum
Cablec	Copper or Aluminum
Conductor Products	Aluminum
Essex	Copper or Aluminum
General Electric	Copper or Aluminum
Hatfield	Copper
Kaiser	Aluminum
Okonite	Copper or Aluminum
Phillips Cables, Inc. (Marked "Phillips W")	Copper or Aluminum
Pirelli	Copper or Aluminum
Reynolds	Copper or Aluminum
Rome Cable	Copper or Aluminum
Southwire	Copper or Aluminum

The above cable may be supplied with UL label for Type USE.

U hw  
July 1987

U hw - Warning sign

Applicable Specifications: REA Drawings UM12-1 and UM12-2

<u>Manufacturer</u>	<u>Size (inches)</u>	<u>Danger Sign Catalog No.</u>	<u>Caution Sign Catalog No.</u>
Brady*	7 x 10	46133	46043
	10 x 14	46131	46041
Dun-Lap*	7 x 10	DL-D710	DL-C710
	10 x 14	DL-D1014	DL-C1014
	14 x 20	DL-D1420	DL-C1420
	20 x 28	DL-D2028	DL-C2028
Eastern Metal*	7 x 10	REA 12-1-710	REA 12-2-710
	10 x 14	REA 12-1-1014	REA 12-2 1014
	14 x 20	REA 12-1-1420	REA 12-2-1420
	20 x 28	REA 12-1-2028	REA 12-2-2028
Lyle*	7 x 10	UM12-1-710	UM12-2-710
	10 x 14	UM12-1-1014	UM12-2-1014
	14 x 20	UM12-1-1420	UM12-2-1420
	20 x 28	UM12-1-2028	UM12-2-2028
May Advertising	7 x 10	MY710C	MY710B
	10 x 14	MY1014C	MY1014B
	14 x 20	MY1420C	MY1420B
	20 x 28	MY2028C	MY2028B

For pressure sensitive decal add "D" prefix to catalog number.

Truck Sign Service*	7 x 10	TSD-710	TSC-710
	10 x 14	TSD-1014	TSC-1014
	14 x 20	TSD-1420	TSC-1420
	20 x 28	TSD-2028	TSC-2028
Lem	7 x 10	LSS-1400	LSS-1500
	10 x 14	LSS-1401	LSS-1501
	14 x 20	LSS-1402	LSS-1502

\*Reflective signs also available.

The signs listed on this page are to be secured to equipment and transformer enclosures by means of an adhesive or by welding. Screws and rivets are not to be used.

U hx  
July 1987

U hx - Cable Route Marker

<u>Manufacturer</u>	<u>Surface Mounted</u>	<u>Catalog Number</u>
Chance		C554-0001
<u>Above Grade</u>		
Carsonite		REA-100
Chance		C554-0183
Dun-Lap		DL-R45 DL-R712
Lyle		UM12-712
May Advertising		MY45A MY712A
For pressure sensitive decal add "D" prefix to catalog number.		
Truck Sign Service		BCW-712

U hy-1  
July 1987

U hy - Splice, Underground, Permanent

(when ordering, specify conductor size, type, whether copper or aluminum and insulation diameter)

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>AMP</u>	"AmpactSplice" (35 kV)
<u>Elastimold (ESNA)</u>	15 kv Style 1500S, straight splice, through #1/0 Style 25-S, straight splice, #2/0 through #4/0 Style 15PCJ-1, straight splice, through 4/0 Style 25-Y, Y-splice 25 KV Style K-25-S, straight splice Style K-25-Y, Y-splice Style 25PCJ-1, straight splice, through 4/0 35 KV Style M-250-S, straight splice
<u>Blackburn</u>	Type S4B (15 KV) Type S4C (25 KV)
<u>Joslyn</u>	Type PMS152 Straight Splice (15 KV) #4 through #1/0
<u>3M</u>	Quick Splice/Quick Splice II, 5400 Series (15, 25, and 35 KV)

U hy - Splice, Underground, Permanent

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>General Electric</u>	15 kV Straight Splice through #1/0, Model 9U16A_100 "Uni-Matic" Through #2/0, Model 9U06A 25 kV "Uni-Matic" Through #2/0, Model 9U06A
<u>Raychem</u>	HVS 1510-R ____ 200 Amp Splice kit
<u>RTE</u>	15 kV S15Z200 Series straight splice (#2 thru #4/0 solid or compacted) 2606780A Series straight splice (4/0 stranded) 25 kV 2606825A Series straight splice 35 kV 2603934B Series straight splice
<u>Somerset</u>	Straight splices Style 15 DHS (15 kV) Style 25 DHS (25 kV) Style 35 DHS (35 kV)

U hy-2  
July 1987

U hy - Splice, Underground, Separable

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

<u>Manufacturer</u>	<u>Catalog Number</u>
Elastimold (ESNA)	
	15 kV
	Style 151-SR, receptacle
	Style 151-SP, plug
	Style 150-DP, deadend plug
	Style 150-DR, deadend receptacle
	Style 150-T, T-tap
	25 kV
	Style K-151-SR, receptacle
	Style K-151-SP, plug
	Style K-150-DR, deadend receptacle
	Style K-150-T, T-tap 921 (6/26/69)

U hy - Splice, Underground, Permanent

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

600 Ampere Continuous Current Rating

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>Elastimold (ESNA)</u>	15 kV Style 650-S, straight splice Style 15PCJ-2, straight splice, through 1250 MCM Style 650-Y, Y-Splice 25 kV Style K650-S, straight splice Style K650-Y, Y-splice Style 25 PCJ-2, straight splice, through 1250 MCM 35 kV Style M650S, straight splice
<u>Blackburn</u>	15 kV - S65B Straight splice 25 kV - S65C straight splice
<u>RTE</u>	15 kV 2604904B Series straight splice (MPS-600) 25 kV 2604905B Series straight splice (MPS-600)

U ja-1  
July 1987

U ja - Transformer Pad

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>Armorcast</u>	600 Series*, Polymer Concrete
<u>Associated Plastics</u>	API 4000 Series RPM
<u>Carolina Dielectrics</u>	Model 0502-1, Fiberglass, Size: 40" x 44"
<u>CDR Systems (Homac)</u>	TP Series*, Fiber reinforced polymer concrete
<u>Chance</u>	C107-0162 and C107-0171 Fiberglass, Size: 40" x 44"
<u>Cyclo</u>	Dwg. No. 730126-2, Molded polyethylene Size: 42" x 42"
<u>Electri-Glass</u>	Fiberglass LP-4145, 41" x 45"
<u>Formex</u>	Model TP-REA, Molded polyethylene

\*Order by catalog number and size.

U ja - Transformer Pad

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>Heil Rotomold, Inc.</u>	T Series*, High density polyethylene
<u>Highline</u>	HL-46B, Fiberglass, Size: approx. 42" x 42"
<u>Major Frame-Crete</u>	ETPP precast, cellular concrete, 42" x 42"
<u>Nordic</u>	TP Series, Fiberglass
<u>Plastic Structures</u>	No. 40402012, Molded polyethylene, Size: 40" x 40"
<u>Quazite Corp.</u>	Composolite - PH Series
<u>Smith Cattleguard</u>	Easi Set T. Series, Precast Reinforced Concrete
<u>Thermodynamics</u>	Poly-Pad, PR Series*, Molded polyethylene

\*Order by catalog number and size.

U ja-2  
July 1987

U ja - Transformer Pad (Sleeve)

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>Associated Plastics</u>	Transformer pad and box assembly, API 4242 RPM Pad and 1730 Box Transformer pads, API 16 and API 45
<u>Concast</u>	Fibercrete modular bases
<u>Electri-Glass, Inc.</u>	BP-2000
<u>Formex</u>	Transformer pad and box assembly TP-REA Series Pad 1730-A Series Box
<u>Highline</u>	Box pad HL-45A, Size: L-43", W-34-1/2", D-32"
<u>Maysteel</u>	CW-GS-P Series
<u>Nordic</u>	GS Series Fiberglass

\*Order by catalog number and size.

U jb  
July 1987

U jb - Splice Shield  
(Refer to Drawing UM45-4)

Manufacturer

Kellems

Catalog Number

No. SE 594-2

Conditional List  
U sc  
July 1987

U sc - Regulators, voltage, pad-mounted  
for underground distribution

12.5/7.2 kV

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Siemens-Allis Single-phase, step-type pad-mounted regulator Type PFR (76.2, 114.3 & 167 kVA)	994 (6/29/72)	To obtain experience.

U sd  
July 1987

U sd - Current Transformers  
600 Volt

Direct Burial Type

<u>Manufacturer</u>	<u>Type or Catalog No.</u>
General Electric	JAL-O

Indoor Type for Pad-Mounted Transformers

<u>Manufacturer</u>	<u>Type or Catalog No.</u>
Astra	AP
General Electric	JAB-O
Sangamo	R6P
Westinghouse	CMV

U si-1  
July 1987

U si - Anodes, Sacrificial  
(Drawings UM11-1, UM26, UM27, M2-7, M2-17)

Zinc Anodes\*

	<u>Pre-packaged With Connecting Wire</u>			<u>Bare Continuous Strip (Ribbon)</u>	
	<u>12 lbs.</u>	<u>30 lbs.</u>	<u>60 lbs.</u>	<u>5/8" x 7/8"</u>	<u>1/2" x 9/16"</u>
Federated Metals	S-12 packaged	S-30 packaged	S-60 packaged	Regular Size Type II	Junior size
General Cathodic Protection Service	12HII-4A	30HII-4A	60HII-4A		
Harco	AZC12GJ	AZC30GJ	AZC60HJ		
Mesa	S-12 packaged	S-30 packaged	S-60 packaged	Regular Size	Junior size
Stuart	SZ-12 -----VIBROX packaged-----	SZ-30	SZ-60		

\*When ordering, specify zinc anodes that meet ASTM B418-73 Type II Composition and REA Specification DT-9, "REA Specification for Zinc Sacrificial Anodes."

U si-2  
July 1987

U si - Anodes, Sacrificial  
(Drawings UM11-1, UM26, UM27, M2-7, M2-17)

Magnesium Anodes\*\*

	<u>Standard Potential</u>			<u>High Potential</u>				
	<u>17 lbs</u>	<u>20 lbs</u>	<u>32 lbs</u>	<u>50 lbs</u>	<u>17 lbs</u>	<u>20 lbs</u>	<u>32 lbs</u>	<u>48 lbs</u>
Federated Metals	17 packaged		32 packaged	50 packaged				
General Cathodic Protection Services	17 packaged		32 packaged	50 packaged	17D3 packaged	20D2 packaged	32D5 packaged	48D5 packaged
Harco	AMC17J	AMC20J	AMC32J	AMC50J	AMC17G	AMC20G	AMC32G	AMC48G
Kaiser Mag.	17 Vibra Pak		32 Vibra Pak	50 Vibra Pak	17 Electromag Vibra Pak	32 Electromag Vibra Pak	50 Electromag Vibra Pak	
Mesa	17 packaged		32 packaged	50 packaged	17D Series	20D2	32D Series	48D5
Stuart	SM-17		SM-32	SM-50	SM-17H		SM-32H	SM-48H

\*\*When ordering, specify magnesium anodes that meet REA Specification DT-10,  
"REA Specification for Magnesium Sacrificial Anodes."

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## PART III - GENERAL PLANT ITEMS

### Explanation of Groups

#### Group I

Instruments in this classification are laboratory or shop standards, used for calibrating all other instruments. They are a precision type which demand the best of care.  
THEY ARE NOT FOR FIELD USE.

#### Group II

Instruments in this classification are high accuracy weatherproof portables, used for general field testing such as checking substations, voltage regulators or control equipment.

#### Group III

Instruments in this classification are weatherproof portables or semi-portables of the thermal type, used for checking substation balance, substation loading, transformer loading, feeder loading, feeder voltages and many consumer loads.

#### Group IV

Instrument in this classification are general purpose weatherproof portables with moderate accuracy, used for checking consumer loads and used where only moderate accuracy is required.

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AMMETERS, INDICATING

<u>Manufacturer</u>	<u>Type</u>	<u>Description</u>	<u>Group*</u>
Biddle	50,000 Series	Thermal, max. pointer	III
General Electric	AK-4	Hook-on (volt-ammeter)	IV
	AK-5	Hook-on (volt-ammeter)	IV
HD Electric	"Max-I-Meter" (All Models)	Thermal ammeters	III
Multi-Amp	115	Volt-Amp-Wattmeter	II
	125	Volt-Ammeter	II
	135	Portable, general field testing	II
Sangamo	ADS	Thermal, max. pointer, socket mount	III
TIF Instruments	PP1000	Hook-on (volt-ammeter)	IV
Westinghouse	PA-141	Volt-Ammeter	II
	PA-151	Volt-Ammeter	II
	PA-161	Volt-Ammeter	II
Weston	370	Reference portable standard	I
	433	Portable, general field testing	II
	633	Hook-on (volt-ammeter)	IV
	904	Portable, general field testing	II

\*Refer to "Part III - General Plant Items" for explanation of groups.

## AMMETERS, RECORDING

<u>Manufacturer</u>	<u>Type</u>	<u>Description</u>	<u>Group*</u>
Esterline-Angus	A	Ink, strip, motor or clock, portable	II
General Electric	CH-3	Ink, strip, motor or clock, portable	II
	CH-4	Ink, strip, motor or clock, portable	IV
	CH-7	Ink, strip, motor or clock, portable, with 15 kV CT	IV
	CF-1	Inkless, strip, motor drive, portable	IV
	CF-7	Inkless, strip, motor drive, portable, with 15kV CT	IV
Sangamo	CCA Series	Thermal, ink, circular motor or clock, portable, pole or socket mount	III
Westinghouse	44	Ink, strip, motor or clock, portable	II
	45	Ink, circular, motor or or clock, portable	IV

\* Refer to "Part III - General Plant Items" for explanation of groups.

VOLTMETERS, INDICATING

<u>Manufacturer</u>	<u>Type</u>	<u>Description</u>	<u>Group*</u>
Multi-Amp	145	Portable, general field testing	II
Westinghouse	A-141	Volt-Ammeter	II
	PC-141	Portable, general field testing	II
	PA-151	Volt-Ammeter	II
	PC-151	Portable, general field testing	II
	PA-161	Volt-Ammeter	II
	PC-161	Portable, general field testing	II
Weston	341	Reference portable standard	I
	433	Portable, general field testing	II
	904	Portable, general field testing	II

\*Refer to "Part III - General Plant Items" for explanation of groups.

VOLTMETERS, RECORDING

<u>Manufacturer</u>	<u>Type</u>	<u>Description</u>	<u>Group*</u>
Esterline-Angus	A	Ink, strip, motor or clock, portable	II
General Electric	CH-3	Ink, strip, motor clock, portable, single range	II
	CH-3	Ink, strip, motor or clock, portable, expanded range	II
	CH-4	Ink, strip, motor or clock, portable, multi-range	II
	CF-1	Inkless, strip, motor drive, portable	IV
Sangamo	CCV Series	Thermal, ink, circular motor or clock, portable, pole or socket mount	III
Westinghouse	44	Ink, strip, motor or clock, portable	II
	45	Ink, circular, motor or clock, portable	IV

\* Refer to "Part III - General Plant Items" for explanation of groups.

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WATTMETERS, INDICATING

<u>Manufacturer</u>	<u>Type</u>	<u>Description</u>	<u>Group*</u>
Multi-Amp	155	Portable, general field testing	II
Westinghouse	PY-5	Portable, general field testing	II
Weston	432	Portable, general field testing	II
	310	Portable, standard	II
	905	Portable, general field testing	II

\*Refer to "Part III - General Plant Items" for explanation of groups.

WATTMETERS, RECORDING

Esterline-Angus	A	Ink, strip, motor or clock, portable	II
General Electric	CF-8	10 watt-var, inkless strip, motor, portable	IV
	CH-3	Ink, strip, motor or clock, portable	II
	CH-4		
	CH-11	30 watt-var recorder, ink or inkless, portable, motor or clock.	II
	CF-11	30 watt-var recorder, inkless, portable, motor	IV
Sangamo	CCW Series	Thermal, ink, circular, motor or clock, portable, pole or socket mount	III
Westinghouse	44	Ink, strip, motor or clock, portable	II

\*Refer to Part III - General Plant Items for explanation of groups.

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Revenue Metering Test Equipment

<u>Manufacturer</u>	<u>Type</u>	<u>Description</u>	<u>Group*</u>
Eastern Specialty	1012	Current transformer field test kit	II
	990A	Meter test board	I
	G-50	Meter test kit	II
General Electric	IB-10	Portable standard	II
Knopp, Inc.	CL-6	Loading Transformer	II
	TE-14	Watthour meter testing equipment	I
	ST-15	Automatic watthour meter test system	I
	ST-31	Automatic three-phase watthour meter test system	I
	KCTS	Current transformer testing system	I
	KVTS	Voltage transformer testing system	I
Sangamo	J-33	Portable standard	II
	J-44		II
States Company	HAPBL	Watthour meter test table	I
	150	Photoelectric watthour meter tester	I
	KFLD	Meter test kit	II
	FDM	Demand meter test table	I

\*Refer to "Part III - General Plant Items" for explanation of groups.

Conditional List  
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GP - Revenue Metering Test Equipment

<u>Manufacturer</u>	<u>Meeting No.</u> <u>and Date</u>	<u>Conditions</u>
Knopp, Inc. "Uniload" Portable Test Set FS-9	1287 9/27/84	To obtain experience.

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RESISTANCE TESTS SETS

<u>Manufacturer</u>	<u>Type</u>	<u>Description</u>	<u>Group*</u>
Associated Research	255A	Ground resistance meter (vibrogram)	IV
	263A		IV
	2101A	Ohmmeter, insulation resistance tester	IV
Biddle	21159	Ohmmeter, insulation resistance tester	IV

\*Refer to "Part III - General Plant Items" for explanation of groups.

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\*DC Voltmeter with Built-In Half Cell

<u>Manufacturer</u>	<u>Type</u>	<u>Description</u>
Electronics Systems Design	CP600	Corrosion Potential Meter (0 to 1.999 volts dc digital)

\*Corrosion test instrument - DC potential





